THE

MECHANIC'S ASSISTANT:

BEING A SELECTION OF

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THE

MECHANIC'S ASSISTANT;

BEING

A SELECTION OF VALUABLE RECEIPTS,

FROM THE

BEST AUTHORS,

AND

PRACTICAL ARTISTS IN EUROPE AND AMERICA;

AND CONTAINING MANY

PROCESSES NEVER BEFORE PUBLISHED.

BY WALDO TUCKER.

WINDSOR, VERMONT:

1837.

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ADVERTISEMENT.

THE author of this work, has for a great length of time, been diligent in searching after a knowledge of the mechanic arts; and has therefore, carefully selected from a number of European and American authors, the most valuable receipts, which are adapted to the various occupations that this work is intended for. The author has also been particular, not to select any but such as could be relied upon, to be genuine; and as such, he feels willing to present them to the public. Particular care has been taken, to make every direction, and every proportion, intelligible to every person. The principal ingredients are to be found in the shops of the druggists, and by purchasing of them, and compounding afterwards, much cost may be saved.

Certificates.

WINDSOR, JULY 1, 1837.

I hereby certify that the receipt, in this book, is true; and is the same way, I manufacture Patent Leather and cloth.

E. W. DAVIS.

CLAREMONT, JUNE 30, 1837.

This may certify that I have used Patent Leather so called, manufactured by E. W. Davis, and I think it as good as any I ever used.

LUTHER S. PORTER, *for*
The Claremont Carriage Co.

WINDSOR, JULY 1, 1837.

I certify that I have used E. W. Davis' Patent Leather and it is good as any.

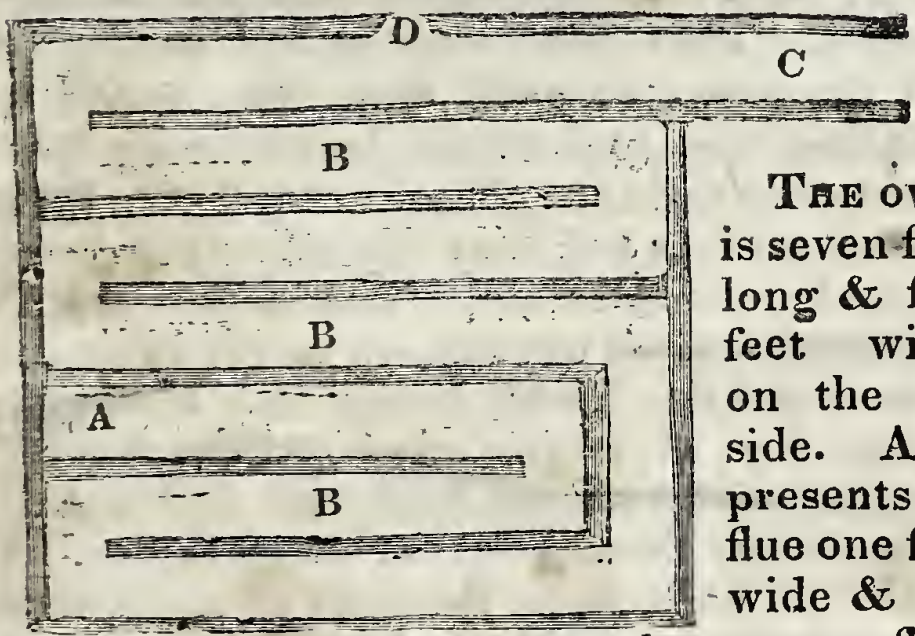
WM. WHITE, *Harness Maker.*

WINDSOR, July 4, 1837.

This may certify that I have examined Patent Leather, manufactured by Mr. E. Winchester Davis, and can recommend it to be as good as any I have ever examined, of American stock.

CHARLES INGALLS.

A SPECIFICATION OF THE OVEN TO DRY PATENT LEATHER AND CLOTH.



THE oven is seven feet long & five feet wide, on the inside. A represents a flue one foot wide & ten inches high. B represents the narrow flues which are ten inches high, and six inches wide, that a brick will reach across. The narrow flues are separated by bricks, set up edgeways; they can be laid two or three high, then covered over with tile and made level,—then plaistered in the best manner. The foundation is laid with stone one foot high, then made level. C represents the chimney which is two feet eight inches, by one foot eight inches. It must be laid ten feet above

the roof. D represents the brick work which is carried up one foot and eight inches, after the ovens are covered over: then there are timbers put on, 3 by 3; then timbers to stand upon those 2 by 3, and eight feet long, to board on, except in the front; there will be only one. The ovens are boarded up with good smooth boards over head, and all excepting the front part, which will be, after one board at the bottom, eight inches high; narrow horizontal doors. There are cleats nailed on the inside of the ovens at each end, two inches wide, leaving one inch and a half between, for the frames to slide on. There are twenty places for those, so that you may dry twenty pieces separately, at each time. The leather is shaved, scoured and set out smooth on the grane, without any oil. Then, before the leather gets quite dry, it is stretched on the frames by means of straps and nails, so that it will be completely level after it becomes dry. It is the best finished on the flesh side. The tacks used for heavy sides of leather are No. 14; light skins, No. 8. You will understand, the oven after it is covered over, must be two feet below the floor. The doors will swing down, and not have but one door down at a time.

DIRECTIONS FOR FINISHING JAPPAN OR PATENT LEATHER.

After the leather is dried on the frames, give it a coat of the varnish, with a large brush.—

The first coat of varnish must have one half pound lampblack to one gallon of the varnish, well stirred in, and it will do to put on, as soon as cold; or if it should be cold weather, it ought to be put on, about milk warm. As fast as one coat dries, draw your frames out of the oven and put on another coat; and so continue with the same varnish until you get a good surface, which will take from two to five coats. When the last coat is dry, scrape it down smooth with a pretty sharp scouring iron, in order to prepare it for the finishing varnish. Then give it a coat lightly put on, of the finishing varnish; let it lie in the oven until perfectly dry; then take it out as before observed, and there will small pimples arise, which must all be cut off with your iron; then give it a heavy coat, so that it will float all over it; then give it as much heat as it will bear. You will raise the heat to near 160 degrees, and continue it so, from ten to twelve hours then let it be in the sun from two to six days. When the finishing coats are applied, your room ought to be perfectly clean so that not any dust may stick to the coating when drying. Cloth may be finished in the same way, by confining on the frames; the cloth being stretched on the frames, size it with the following size—one quart flax seed boiled in a bag, for four hours, in two gallons water; then take out your flax seed and add from one to two quarts soft soap, stir it well together; put it on with a brush and dry it; then put on a coat of the first men-

tioned varnish let it dry; then coat it once more with the same varnish; scrape it down if necessary; then give it one coat of the finishing varnish, that will float all over it; then dry it in the same way as the last coat on the leather. Horse hide, Calfskins and all kinds of skins may be finished in the same way.—Any kind of cotton or linen cloth, may be finished in this way, and may be painted or gilded for table spreads, and will stand against boiling water and soap. Cloth may be dried on a small scale without the expense of a large oven, and may be afforded as cheap as the common oil-spreads for tables.

VARNISH FOR PATENT LEATHER, AND CLOTH.

One gallon linseed oil, two ounces Sal amoniac, one pound Asphaltum, four ounces Turkey umber, ground fine; boil it together, beginning with a moderate heat, until it becomes united, stirring until you raise the heat to that degree it is finished; which will take from five to six hours, it must be boiled until it will adhere to your finger; after being boiled sufficient take it off and stir it until cold; then add two gallons of spirits turpentine; then let it stand until cold and settled.

The above has been used with good success and considered to be the best for leather and cloth; likewise for varnishing all kinds of dark painted work, such as carriages, chairs, &c. The following has been used—one gallon lin-

seed oil, one pound Asphaltum, four ounces resin, four ounces sugar of lead, four ounces litharge, two ounces red lead; put in your litharge, red lead, and resin, then heat it until it boils; then add the Asphaltum; boil it two hours; raise the heat until it is thick enough for use. If it is too thick, thin it with spirits of turpentine. If leather or cloth is finished by the last method, the cloth must be sized as before mentioned, and in order to give it a black colour, take one gallon of boiled oil, from two to four ounces of red lead, two quarts of soap, one ounce of lamp black, whiting sufficient to make a body and give it two coats.

FAT OIL VARNISH.

Fixed, or fat oil will not evaporate; nor will it become dry of itself. To make it dry it must be boiled with metalic oxides. Litharge is generally used for this purpose. Oil so prepared, is called drying oil. To accelerate the drying of oil varnish, oil of turpentine is used. Gum copal and amber are the substances principally employed in oil varnishes, the copal being whitest is used for varnishing light, the amber for dark colours. It is best to dissolve them before mixing with the oil, because by this means, they are in less danger of being scorched, and at the same time, the varnish is more beautiful. They should be melted in an iron pot, over the fire, and are in a proper state for receiving the oil when they give no

resistance to the iron spattula, and when they run off from it, drop by drop.

TO MAKE OIL VARNISH.

Pour four, six, or eight ounces of drying oil among sixteen ounces of melted copal or amber, by little and little, constantly stirring the ingredients, at the same time with spattula.—When the oil is well mixed with the copal or amber, take it off the fire, and when it is pretty cool, pour in sixteen ounces of the essence of Venice turpentine. After the varnish is made, it should be passed through a linen cloth. Oil varnishes become thick by keeping, but when they are to be used, it is only necessary to pour in a little Venice turpentine, and to put them a little on the fire. Less terpentine is necessary in summer than in winter; too much oil hinders the varnish from drying, but when too little is used, it cracks and does not spread properly.

BLACK VARNISHES FOR COACHES AND IRON WORK.

This varnish is composed of asphaltum, resin, and amber, melted separately, and afterward mixed; the oil is then added, and afterwards, the turpentine as directed above. The usual proportions are twelve ounces of amber, two of Asphaltum, six of oil, and twelve of turpentine.

A VARNISH FOR RENDERING SILK, WATER AND AIR-TIGHT.

To render the linseed oil drying, boil it with two ounces of sugar of lead, and three ounces of litharge, for every pint of oil, till the oil has dissolved them; then put a pound of bird lime, and half a pint of the drying oil into a pot of iron or copper, holding about a gallon, and let it boil gently over a slow charcoal fire till the bird lime ceases to crackle: then pour upon it two pints and a half of drying oil, and boil it for about an hour longer; stir it often with an iron or wooden spattula. As the varnish in boiling swells much, the pot should be removed from the fire and replaced when the varnish subsides. While it is boiling it should be occasionally examined in order to determine whether it is boiled enough. For this purpose, take some of it upon the blade of a large knife, and after rubbing the blade of another knife upon it, separate the knives, and when on their separation, the varnish begins to form threads between the two knives, it has boiled enough, and should be removed from the fire. When it is almost cold, add about an equal quantity of spirits of turpentine; mix both well together, and let the mass rest, till the next day; then having warmed it a little, strain and bottle it. If it is too thick, add spirits turpentine. This varnish should be laid upon the stuff, when perfectly dry, in a lukewarm state, a thin coat of it upon one side, and about

twelve hours after, two other coats should be laid on, one on each side; and in twenty four hours the silk may be used.

TO MAKE CLOTH, WATER AND AIR TIGHT.

Dissolve India rubber, cut small, in five times its weight of spirits turpentine, by keeping some days together; then boil one ounce of this solution, in eight ounces of drying linseed oil, for a few minutes, and strain it. Use it warm. If you wish the cloth black, common black paint will answer, or you may mix lamp black with the above.

ESSENTIAL OIL VARNISH.

The essential oil varnish consists of a solution of resin, in oil of turpentine, or other essential oil. This varnish being applied, the turpentine evaporates, leaving the resin behind. It is commonly used for pictures.

WHITE ELASTIC VARNISH.

One quart of Dutch oil, two ounces of white lead, one and a half ounces sugar lead, put it into a tin pan, stir it well, let it stand in the sun, until it becomes settled and as thick as tar; then add spirits of turpentine to thin it, fit for use. This makes a beautiful varnish for maps and charts, and will not fade. The paper must be first sized with gum Tragencanth dissolved

in water, and the size put on with a clean sponge.

VARNISH FOR TIN.

One gallon Dutch oil, four ounces Turkey umber, four ounces gum shellac, one ounce dragon's blood, boiled well together; let it get nearly cold, then add two gallons spirits turpentine.

VARNISH FOR LEATHER.

Dissolve one ounce of India rubber, cut small, in one pint of neats feet oil, one half pound gum shellac, dissolved in one pint alcohol; mix them well together, add two ounces Ivory black, and let them stand in a warm heat, for two days, and it is fit for use—to be put on with a soft brush.

VARNISH FOR BOOTS AND SHOES.

Take three ounces spermacitti, and melt it in an earthern vessel, over a slow fire. Add to it, six drachms of India rubber, cut into thin slices, and it will presently dissolve, then add half a pound of tallow, two ounces hog's lard, and four ounces amber varnish; put on three coats with a common brush. This preparation renders the leather impervious to water, and leaves a fine polish. Add two ounces of lampblack, and it makes the best composition for harness leather.

WATER PROOF BOOTS AND SHOES.

The following method of preparing water proof leather, at a very small expense, will be found invariably to succeed. Take one pint of drying oil, two ounces yellow wax, two ounces spirits turpentine, and one ounce burgundy pitch, melted over a slow fire; with this composition, new shoes and boots are to be rubbed, at a small distance from the fire, with a sponge, as often as they become dry, until they are fully saturated; the leather then is impervious to wet; the shoes and boots last much longer, acquire softness and pliability, and thus prepared, are the most effectual preservation against colds and chilblains.

FRESCO PAINTING.

Before you begin to paint, it is necessary to apply two layers of stucco on the place where your work is to be executed; if you are to paint on a wall of brick, the first layer is easily applied; if of free stone closely joined, it is necessary to make excavations in the stone and to drive in nails or pegs of wood, in order to hold the layers together. The first layer is made of good lime and a cement of pounded brick, or which is better, river sand, which latter forms a layer more uneven and better fitted to attach the second smooth layer to its surface. Before applying the second layer on which you are to paint; the first should be perfectly dry. When the first layer is per-

fectly dry, wet it again with water in proportion to its dryness, that the second layer may more easily incorporate with it. The second layer is composed of lime slacked in the air, and exposed for a whole year, and of river sand of an equal grain and moderately fine. The surface of this second, must be uniformly even. It is laid on with a trowel, and the workman is provided with a small piece of wood to remove the large grains of sand. To give a fine polish to this surface, a sheet of paper should be applied on it, and the trowel passed and repassed over the paper. The workman must not extend the layer over a greater space than the painter is able to finish in a day; as it is necessary the ground should always be fresh and moist under his pencil.—The ground being thus prepared, the painter begins his work; but as painting in fresco must be executed rapidly, and as there is not time to retouch any of the strokes of the brush with good effect, he will first provide himself with a large finished drawing in chalk, or paintings in distemper, of the same size as the work which he has to paint, so that he shall have only to copy these drawings on the wall.—These drawings are generally made on large sheets of paper pasted together, generally termed cartoons. The painter traces the outlines of the figures on the plaster, by passing a steel point over them, or pricking them closely and passing very finely powdered charcoal through the prickled holes. He then proceeds

to the completion of his work, having his chief tints ready prepared in separate earthern pots, and generally first trying their effect on a dry smooth tile, which quickly imbibes their moisture and discovers the hue which they will have on the wall. All natural earths are good for painting in fresco. The colours are ground and tempered in water. It is to be remarked that all the colours used in this method of painting, brighten as they grow dry, except the red varnish, the brownish red ochre, ruth ochre, and the blacks, particularly those that are passed through the fire. The best colours are white, made of old lime, and white marble dust, (the proportional quantity of the latter depends on the quality of the lime, and must be found by trial, as too great a quantity of marble dust will turn the colour black) ultra marine blue, the black of charcoal, yellow ochre, burnt vitrol, red earth, green of Verona, black and burnt ochre. Other colours which require to be used with greater precaution, are enamel blue, and cinnabar. Enamel blue must be applied instantaneously and while the lime is very moist, otherwise, it will not incorporate; and if you retouch with it, you must do it an hour or more after the first application of it, in order to increase its lustre. Cinnabar has a splendour, almost beyond all other colours, but it loses it when mixed with lime. It may however be employed in places not exposed to the air, if proper care is used in preparing it. For this purpose reduce a quantity

of the purest cinnabar to powder, put it into an earthern vessel and pour lime water on it two or three times. By this process, the cinnabar receives some impression from the lime water, and you may then use it with greater safety. The white of lime is formed by mixing lime, slaked a long time before, with good water.—The lime deposites a sediment at the bottom of the vessel. When the water is poured off this sediment is the white of lime. Another kind of white may likewise be made from egg shells, pounded in quantities and boiled in water, together with quick lime, and afterwards put into a strainer and washed repeatedly with spring water. The shells must be again pounded until the water employed for that purpose becomes pure and limpid; and when the shells are completely reduced to powder, they are ground in water, made up in small pieces and dried in the sun. The effect of this colour must be ascertained by experiment. Ochres of all kinds, make good colours for fresco, being previously burnt in iron boxes. Naples yellow is dangerous to be used, when the painting is much exposed to the air. Blacks, from charcoal, peach stones, and vine twigs, are good. There is another used—it is made of the lees of burnt wine. Roman vitrol gathered at the furnaces, and called burnt vitrol, being afterwards ground in spirits of wine, resists the air extremely well. There is also a red extract from this preparation, somewhat like that of lac. This colour is a good preparation for the

layers, where cinnabar is afterward to be used. Draperies, painted with these colours, are as bright as fine lac used with oil. Ultra marine never changes and seems to communicate its permanent quality to the colours with which it is mixed. Fresco painting is performed with colours diluted in water, with which they incorporate, and are sometimes as durable as the stucco itself.

PRINCIPAL COLOURS FROM WHICH ALL THE TINTS ARE MADE, AND THEIR QUALITIES IN PAINTING WITH OIL.

Flake white is the best white known. This colour should be ground with the whitest poppy oil that can be procured; it is often found to turn yellow, on account of the oil generally sold by that name not being really drawn from poppies. It is the nature of all whites to sink into whatever ground they are laid on, therefore, they should be laid on white grounds.—Ivory black is the best black. It is a colour which mixes kindly with all the others. It is the true shade for blue, and when mixed with a little Indian red, it is the best shadow colour that can be used; it is generally ground with linseed oil and used with drying oil. Ultramarine is the finest blue in the world; it is a tender, retiring colour, and never glares, and is a beautiful glazing colour. It is used with poppy oil. Prussian blue is a very fine blue, and a kind working colour. It is ground with

linseed oil, though nut oil is best. Light ochre is a good mixing colour; it is usually ground with linseed oil. All yellows are strengthened with red, and weakened with blues and greens. Light red is nothing but fine light ochre burnt. This and white, in mixing, produce a most perfect flesh colour. It is a beautiful clean colour, but too strong for the white, and therefore, will grow darker; it should be ground and used with nut oil. No vermilion but what is made of the true native cinnabar, should be used. It is ground with linseed oil, and should be used with drying oil. Carmine is the most beautiful crimson; it is a middling colour between lake and vermilion, is a fine working colour, and glazes well. It should be ground with nut oil and used with drying oil. Lake is a tender, deep red, but of no strong body, therefore, it should be strengthened with Indian red. It is the best glazing colour that can be used; it is ground with linseed oil, and used with drying oil.

Indian red is a strong, pleasant working colour, but will not glaze well and when mixed with white, falls a little into lead; it is ground and used as the lake. Brown pink is a fine, glazing colour, but of no strong body. In glazing the shadows, it should be laid before the other colours that are to enrich it; it is one of the finishing colours, and therefore, should never be used in the first painting. It is strengthened with burnt umber, and weakened with terrevente, ground with linseed oil and

used with drying oil. Burnt umber is a fine, warm brown and a good working colour, and mixes finely with the warm shade.

WHITE SATIN.

All whites should be painted on white grounds laid with a good body of colour, because this colour sinks more into the ground than any other. There are four degrees of colours in the first lay, to white satin. The first, is the fine white for the lights. The second, is the first tint, which is made of a fine white, and a little ivory black, mixed to an exact middle degree, between the white and middle tint. This colour follows the white and it is with this, you should shape the lights into character, before you lay on any other; and take care that this first tint appears distinctly between the white and middle tint; otherwise, the beauty and the character of the satin, will be spoiled.—The middle tint should be made of white, black, and a little Indian red. These three colours are very friendly, and mix to a beautiful, clear colour of a pearly hue, which has the true brightness and warmth of the general hue of the satin. Remember to allow for the red hue, changing a little to the lead. If there is occasion to make any part in the middle tint lighter, do with the first tint only.—This colour should also be laid sparingly, before the white, in all the little lights that happen in the middle tints and shadows, on which

you should lay the white with one little touch, and be sure not to cover all the parts that were made with the first tint; if you do, it will spoil the character and look like a spot, for want of the softening edge or border which must be between the white and middle tint. The shade tint should be made of the same colour as the middle tint, but with less white, so that it is dark enough for the shadows in general, with which, make out all the parts of the shadows nicely to character, which is the work of the first lay. Next follow the reflects and finishing tints. Brown ochre, mixed with the colour of the light, is the most useful colour, in general, for all reflects in draperies that are produced from their own colours. All accidental reflexes are made with the colour of the parts from which they are produced, and the local colours that receive them. There are but two reflecting tints wanted in draperies in general; one should be lighter than the middle tint, the other, darker. These colours may be a little changed on the pallet with the first and middle tints, as occasion requires, or lightly broken on the part that receives them; but this last method is not so safe as the other. The tint sufficient for blending the dark shadows to the mellow, tender hue, is made with the shade tint and a little brown ochre, which should be laid on very sparingly, with slight touches, for fear of making them dull and heavy; if it is overdone, recover it with colour that it is laid upon. We often see

little blue used in the first tint of white satin.

BLUE SATIN.

Blue satin is made of Prussian blue and fine white. The best ground for blue is white, for the lights, and black and white, for the shadows. The first lay of colours for blue, is divided into three degrees or tints. First, make the middle tint of a beautiful azure. Then mix the colour for the light, about a middle degree between that and white. Make the shade tint dark enough for the shadows in general. All the broad lights should be laid with plenty of colour and shaped to character with the middle tint, before you lay on any other colours. Remember, the less colours are mixed, the better they will appear, for the lights of blue should be managed with as much care as those of white satin. Next, follow with the cast of the middle tint, and then make out all the shadows. The more you derive the shade tint, the better it will receive the reflects and finishing tints. The shadows should be strengthened and blended with ivory black, and some of their own colour, which will mix with them in a tender, mellow hue. The reflects are made as those of white satin; that is, with ochre and some of the lights, which should be perfectly done as you intend them, at one painting. The shadows when dry, may be a little improved, if there is occasion to alter them with the colours they are made with.

The Prussian, proper to be used, is that which looks of the most beautiful azure; before it is ground the better it will work and appear.

VELVET.

The method is to make out the first lay with the middle tint, and shade tint, on which lay the high lights with light touches, and finish the shadows in the same manner as those of satin; but the nearest imitation of velvet is done by glazing; the method of which is, to prepare a ground or dead colour, with such colours as will, when dry, bear out and support the glazing colour in its highest perfection.—The nature of the glazing colour is to be of a fine transparent quality, and used simply with oil, only so that, whatever ground it is laid on, the whole may appear distinctly through it.—The best ground for blue, is made with white, and ivory black. The white is for the high lights, which, with the middle tint, and shade tint, makes out the first lay, like mezzotinto.—Remember to make the middle tint lighter in proportion to the glazing, because that will make it darker. It is often necessary to cover all but the high lights with a thin glazing, laid in less quantity, than if it was to be done once only. If any of it touches the lights, wipe it off with a rag. The very high lights should be improved, and made of a fine white, and left to dry. The glazing colour is Prussian, ground very fine with nut oil, and should be

laid with a large stiffish tool. It is on the last glazing, we should strengthen and finish the shadows. When glazing blue, the lights may be glazed with ultramarine; though all the other parts are done with Prussian. If the lights and middle tint mix to a beautiful, clear colour of a middle hue between both, there will be no occasion for a colour to go between them, as in blue satin.

PINK COLOUR.

There are two different methods of painting a pink colour; one is by glazing, the other is done by a body of colours at one painting.—The same grounds do for both; which should be a whitish colour inclining to yellow, for the lights, and Indian red, lake and white, for the shadows. The second painting for the glazing method, is done with the same colours, and a very little vermilion, and white for the lights. When it is dry, glaze it with fine lake, and then break and soften the colours into harmony directly. The other method is to make the high lights with carmine and white, the middle tint, with lake white, and a little carmine, and the shadows, with lake and India red, with a little vermilion for the reflection. But remember, the shadows will require to be broken with some tender obscure tint.

Light red tint is made of light red, and white. Vermillion tint is only vermillion and white, mixed to a middle tint. It is the most brilliant light red that can be. Carmine tint is carmine and white only, mixed to a middle tint; it is one of the most beautiful, red colours; it is one of the finishing colours, and laid on the finishing colour without mixing. Rose tint is made of the red shade, and white, mixed to a middle degree, or lighter. Yellow tint is often made of Naples yellow, and white; but it is as well to use light ochre, and white. It follows the light red tints, and yellow should always be laid before the blues. Blue tint is made of ultramarine and white, mixed to a light azure. Lead tint is made of ivory black, and fine white, mixed to a middle degree. Green tint is made of Prussian blue, light ochre, and white to be laid sparingly in the middle tints. Shade tint is made of lake, and Indian red, black and white, mixed to a beautiful murry colour of a middle tint. This is the best mixture for the general ground of shadows. It mixes well with the lights, and produces a clear colour, a little inclined to the reddish pearl. Red shade is nothing but lake, and a very little Indian red. Warm shade is made of lake, and brown pink, mixed to a middle degree. Dark shade is made of ivory black and a little India red only. The colours and tints necessary for the first and second stages of painting, are first,

flake or fine whites; second, light ochre and its tints; third, light red and its two tints; fourth, vermillion and its tint; fifth, a tint composed of lake vermillion and white; sixth, rose tint; seventh, blue tint; eighth, lead tint; ninth, green tint; tenth, half shade tint; eleventh, shade tint; twelfth, red shade; thirteenth, warm shade. The first lay of colours consists of two parts; the one is the work of the shadows only, and the other, that of the lights. The work of the shadows, is to make out all the drawing, very correctly, with the shade tint, in the same manner, as if it was to be done with this colour only; and remember to lay the colour sparingly. The lights should all be laid in with the light red tint. These two colours united, produce a clear, middle tint. In uniting the lights and shades, you should use a long softener, about the size of a large swan quill, which will help to bring the work into character; then go over the darkest shadows with the warm shade, which will finish the first lay. Next, in order to finish the first painting, improve the reds and yellows, to the complexion, and after them, the blues, observing, the blues on the reds, make the purple; and on the yellow, produce the green. When the cloth is of a dark or bad colour, there must be a strong body of colour laid all over the shadows. The light red, and white improved, is superior to all other colours for the first lay, which should be always done with a full pencil of a stiff colour

made brighter than the light. The second painting begins with laying on the least quantity of poppy oil that can be, then wipe it almost all off with a piece of dry silk handkerchief. The second painting is divided into two parts, one the first laying of the second painting which is scumbling the lights and glazing the shadows, the other finishing the complexion. First, scumbling is going over the lights where they are to be changed with the light and red tints. Second, go over the complexion with the virgin tints; this should be done in the same manner as you laid them in the second part of the first painting, that is, with the reds yellow and blues, blending them with delicate touches of the tender middle tints. Third, painting or finishing. Begin with correcting all the glazing first where the glazing serves as a ground. If any of the colours of the pallet want to be a little changed when you are painting, it is much better to do it with the knife on the pallet, than with the pencil, because the knife will mix and leave it in good order for the pencil.

METHOD OF PREPARING GREEN WOOD SO THAT IT WILL NOT SPLIT IN TURNING.

Having cut your wood into pieces of a proper size, put it into a vessel full of ley made of wood ashes. Boil it there one hour; then taking the cauldron off the fire, allow the ley to cool, then take out the wood and dry it in the shade.

METHOD OF GIVING TO PLUMB TREE THE COLOUR OF BRAZIL WOOD.

Slack lime with urine and bedaub the wood over with it, while it is hot; allow it to dry; then take off the coat of lime and rub it with chamois skin, well oiled; or steep your wood in water having a quantity of alum dissolved in it, five or six hours, kept luke warm during a night, and when it is dry, rub it as before directed with chamois skin well oiled.

A FINE BLACK COLOUR FOR WOOD.

Steep your wood for two or three days in lukewarm water, in which a little alum has been dissolved; then put a handful of logwood cut small, into a pint of water and boil it down to less than half a pint. If you then add a little indigo the colour will be more beautiful. Spread a layer of this liquor quite hot on your wood with a pencil, which will give it a violet colour. When it is dry, spread on another layer, dry it again and give it a third. Then boil verdigris at discretion, in its own vinegar and spread a layer of it on your wood; when it is dry, rub it with a brush and then with oiled chamois skins. This gives a fine black, and imitates perfectly, the colour of ebony.

DYEING WOOD, MAHOGANY COLOUR.

Take five pounds of logwood in the chips

to three pails of soft water, boil in a brass kettle till the strength is out; then take the chips from the liquor and boil down to about two quarts, then strain this liquor through white flannel into another brass kettle and make it about blood warm and add half an ounce gallingill root cut in chips and boil down to one quart and when the liquor is reduced below scalding heat, add half an ounce of the best dragon's blood finely pulverized, let the gentle heat continue for a considerable length of time or till the dragon's blood is dissolved, then strain the second time and bottle for use. The stain must be made warm when you make use of it; after the work has had two or three coats, and when dry, rub it with fine paper and varnish. This stain is used on gun stocks and musical instruments, and on various kinds of cabinet work. It is an unfading colour.

ROSE WOOD STAIN.

To one gallon whiskey add one pound camwood in a glass bottle, shake the mixture frequently for two or three days; give the timber one or two coats of this, stain then have ready prepared one ounce of green vitrol dissolved in a pint of vinegar. With a graining brush, grain it according to fancy, then varnish one coat with some good rose pink finely ground; afterwards varnish with two or three coats of clear varnish.

ANOTHER VERY BEAUTIFUL MAHOGANY STAIN.

Take any white hard wood (soft maple is the best,) and take nitric acid diluted with water in proportion, one part of water to three of the acid; when dry, take a sponge and shade with the following composition—take one ounce of super carbonate of soda, and one ounce of dragon's blood, made fine and dissolved in one pint alcohol. The soda is then to be added with this composition. Shade according to fancy; and when dry, polish the surface with a piece of deer skin and chalk, made perfectly fine, or rub it hard with a piece of felt hat without the chalk and varnish.

TO MAKE A BEAUTIFUL SOFT GLASS FOR JEWELRY.

Take six ounces of clean white sand, three ounces of red lead, three ounces of pure pearl ashes, one ounce of salt petre, half an ounce of borax, and two drachms of arsenic; mix and pound them all together. Put the compound in a crucible and set it on a common fire, often stirring it with an iron rod till it is well melted and becomes transparent. This compound will liquify very easily, without any great heat, if the sand is fine; it sometimes requires to be ground in a flint or glass mortar, and if it be kept melted awhile, will become beautifully transparent, and may be cast or blown in the manner of other glass. This glass may be

changed to a red or ruby colour, by adding and fusing together with it, a small quantity of finely powdered precipitate of gold, (gold precipitated from a solution in nitro muriatic acid by the addition of tin.) A green colour may be given by a precipitate of copper, and yellow, by calcined green vitrol.

SOLDER FOR TIN.

Take four parts of pewter, one of tin, and one of bismeth, melt them together and cast them into narrow lengths.

ANOTHER SOLDER FOR TIN.

Sixteen parts of tin, eight of lead, and four of bismeth, melted together.

TO STAIN WOOD YELLOW.

Take any white wood and brush it over several times with the tincture of turmuric, ground to powder, to a pint of spirits; and after they have stood some days, strain off the tincture. If the yellow colour is desired to have a reddish cast, a little dragon's blood must be added.

TO STAIN WOOD RED.

For a bright red stain for wood, make a strong infusion of Brazil wood in a stale urine,

or water impregnated with pearl ashes, in the proportion of an ounce to a gallon; to a gallon of either of which, the proportion of the Brazil wood must be a pound, which, being put to them, they must stand together for two or three days, often stirring the mixture.—With this infusion, strained and made boiling hot, brush over the wood to be stained, till it appears strongly coloured: then while yet wet, brush it over with alum water, made in the proportion of two ounces of alum to a quart of water.—For a less bright red, dissolve an ounce of dragon's blood in a pint of spirits of wine, and brush over the wood with the tincture, till the stain appears to be as strong as is desired; but this is in fact, rather lacquering than staining.

TO STAIN WOOD BLUE.

Wood may be stained by means, either of copper or indigo. The method of staining blue with copper, is as follows:—Make a solution of copper in aqua fortis, and brush while hot, several times over the wood; then make a solution of pearl ashes in the proportion of two ounces to a pint of water, and brush it hot over the wood, stained with the solution of copper, till it is of a perfectly blue colour.

TO STAIN WOOD PURPLE.

Brush the wood to be stained, several times

with a strong decoction of logwood and Brazil wood, made in the proportion of one pound of logwood and a quarter of a pound of the Brazil to a gallon of water, and boiled for an hour or more. When the wood has been brushed over, till there is a sufficient body of colour, let it dry, and then be slightly passed over by a solution of one drachm of pearl ashes, in a quart of water. This solution must be carefully used as it will gradually change the colour from a brown red, which it will be originally found to be, to a dark blue purple, and therefore, its effect must be restrained to the due paint for producing the colour desired.

VANEERING.

Vaneering, or Fineering, a kind of marquetry, or inlaying, whereby several thin slices or leaves of fine woods of different kinds are applied and fastened on a ground of some common wood. There are two kinds of inlaying, the one which is the most common, and more ordinary, goes no farther than the making of compartments of different woods; the other, requires much more art in representing flowers, birds, and similar figures. The first kind is properly called Vaneering; the latter is more properly called Marquetry. The wood used in vaneering is first sawed out into slices or leaves about a line in thickness; i. e. the twelfth part of an inch. In order to saw them, the blocks or planks are placed upright, in a

kind of a sawing press. These slices are afterwards cut into narrow slips and fashioned divers ways, according to the design proposed; then the joints, having been exactly and nicely adjusted, and the pieces brought down to their proper thickness, with several planes for the purpose, they are glued down on a ground or block with good strong English glue. The pieces being thus jointed and glued, the work if small, is put in a press, if large, it is laid on a bench, covered with a board and pressed down with poles or pieces of wood, one end of which, reaches to the ceiling of the room, and the other bears on the board. When the glue is thoroughly dry, it is taken out of the press and finished, first with little planes, then with scrapers, some of which resemble rasps, which take off the dents, &c. left by the planes. After it has been sufficiently scraped, they polish it with the skin of a dog fish, wax and a brush, or polisher of shave grass, which is the last operation.

LITMUS BLUE.

This is a beautiful blue, and will run in a pen as free as ink. It is made of lacmus, and prepared thus :—take an ounce of lacmus and boil it in a pint of small beer wort, till the coloring is as strong as you would have it—then pour off the liquor into a gallipot and let it cool for use. This affords a beautiful colour, has extraordinary effects, and is a holding

colour; if it is touched with aqua fortis, it immediately changes to a fine crimson, little inferior to carmine.

A VARNISH FOR BRASS TO GIVE THE APPEARANCE OF GOLD.

Dissolve two ounces of pure gum, in forty eight ounces of alcohol, and place the solution in a bottle, in a pot filled with sand, which place over a strong coal fire, until you perceive the sand become hot; then slacken your fire to a gentle heat, to prevent the evaporation of the spirit, and avoid bursting the vessel; cover the neck of your bottle, with a piece of bladder, in which, make a number of holes, with a pin, to admit the air. In another vessel, and in the same quantity of spirits of wine, dissolve one ounce of gum tragacanth, in grains. When completed, mix the two solutions together, and put into the mixture, three grains of sanders wood, and let the whole stand for twelve hours, in a gentle heat. Strain it through paper, and keep it for use in a perfectly clean phial. Sanders wood is preferable to any other substance, for giving a golden color to the varnish, made with lac. If you wish it of a pale color, omit one half of the sanders wood; and if you wish it of a darker color, add as much more of the above mentioned quantity. It may be laid on with a brush or pencil. An article thus varnished, will preserve its brilliancy, as long as the varnish lasts;

but they must not be rubbed with chalk, nor with a hard brush but only washed with soft linen rags.

A GOOD WHITE VARNISH.

Take ten ounces spirits wine, gum sandarak in powder, and Venetian turpentine, of each two ounces; put them into a bottle that will contain twice the quantity, and place the bottle in an iron pot, filled with sand; make a gentle fire under the pot, so as to heat the sand; frequently shake the bottle, until the gum and turpentine are dissolved. This is a useful varnish for ornamental purposes, or bright colours.

ANOTHER WHITE VARNISH.

Take eight ounces of gum mastick; two ounces of gum sandarack, and one quart of spirits wine; add one ounce of Venetian turpentine, dissolve as above directed, and it is fit for use.

SPIRIT VARNISHES.

When resins are dissolved in alcohol, commonly called spirits of wine, the varnish dries very speedily, but is subject to crack. This fault is corrected by adding a small quantity of oil turpentine, which renders it brighter and less brittle when dry.

TO DISSOLVE GUM COPAL IN SPIRITS OF WINE.

Dissolve half an ounce of camphor, in one pint spirits of wine; put it into a circulating glass, and add four ounces copal, in small pieces, set it in a sand heat, so regulated, that the bubbles may be counted as they rise from the bottom: and continue the same heat till the solution is completed. Camphor acts more powerfully upon copal than any other substance. If copal is finely powdered, and a small quantity of dry camphor, rubbed with it in a mortar, the whole becomes in a few minutes a tough coherent mass. The process above described will dissolve more copal, than the menstreum will retain, when cold. The most economical method will therefore be, to set the vessel, which contains the solution, by for a few days, and when it is perfectly settled, pour off the clear varnish and leave the residue for a future operation. This is a very bright solution of copal; it is an excellent varnish for pictures, and may perhaps be found to be an improvement in fine Jappan works, as the stoves used in drying those articles, may drive off the camphor entirely, and leave the copal pure and colourless upon the work.

A VARNISH FOR WAINSCOT, CANE CHAIRS, &c.

Dissolve in a quart of spirits of wine, eight ounces of gum sandarack, two ounces of seed

lac, and four ounces of resin; then add six ounces of Venice turpentine. If the varnish is to produce a red colour, more of the lac, and less of the sandarack should be used; and a little dragon's blood should be used. This varnish is very strong.

A VARNISH FOR TOILET BOXES, CASES, FANS, &c.

Dissolve two ounces of gum mastick, and eight ounces of gum sandarack, in a quart of alcohol; then add four ounces Venice turpentine.

TO STAIN WOOD GREEN.

Dissolve verdigris in vinegar, or chrystals of verdigris in water, and with the hot solution, brush over the wood till it is duly stained.

A VARNISH FOR VIOLINS AND OTHER MUSICAL INSTRUMENTS.

Put four ounces of gum sandarack, two ounces of lac, two ounces gum mastick, and one ounce of gum elemi, into one quart of alcohol, and hang them over a slow fire, till they are dissolved, then add two ounces of turpentine.

A VARNISH FOR EMPLOYING VERMILION FOR PAINTING EQUIPAGES.

Dissolve in a quart of alcohol, six ounces of sandarack, three ounces gum lac, and four

ounces resin; afterwards, add six ounces of the cheapest kind of turpentine, mix it with a proper kind of vermilion, when it is to be used.

SEED LAC VARNISH.

Take spirits of wine one quart, put it in a wide mouthed bottle; add to it eight ounces seed lac, that is large grained, bright and clear, and free from sticks; let it stand two days or longer, in a warm place, often shaking it, strain it through a flannel, into another bottle and it is fit for use.

SHELLAC VARNISH.

Take one quart spirits of wine, eight ounces of the thinnest and most transparent shellac, which if melted in the flame of a candle, will draw out in the longest and finest hair, mix and shake these together, and let them stand in a warm place, for two days, and it is ready for use. This varnish is softer than that which is made of seed lac; and therefore, is not so useful, but may be mixed with it for varnishing wood, &c.

WHITE VARNISH FOR CLOCK FACES &c.

Take of spirits of wine highly rectified, one pint, which divide into four parts, then mix one part, with half an ounce of gum mastick,

in a phial; one part of spirit, and half an ounce of gum sandarack, in another phial; one part of spirit and half an ounce of the whitest parts of gum benjamin. Then mix and temper them to your mind. It would not be amiss to add a little bit of white resin, or clear Venice turpentine, in the mastick bottle; it will assist in giving a gloss. If your varnish proves too strong and thick, add spirit of wine only; if too hard, some dissolved mastick; if too soft, some sandrack or benjamin. No other rule can be given, unless the quantity of the gums, and the spirit could be ascertained.—When you have brought it to a proper temper, warm the silvered plate, before the fire, and with a flat camel's hair pencil, stroke it all over, until no white streaks appear.

A CEMENT FOR GLASS GRINDERS.

Take pitch and boil it,—add thereto and keep stirring it all the while, fine sifted wood ashes, until you have it of a proper temper. A little tallow may be added as you find necessary. For small work, to four ounces of resin, add one fourth of an ounce of bees wax melted together, and four ounces of whitening made previously red hot. The whitening should be put in while hot that it may not have time to imbibe moisture from the atmosphere.

TO SOLDER OR CEMENT BROKEN GLASS.

Broken glass may be soldered or cemented in such a manner as to be as strong as ever, by interposing between the parts, glass ground up like a pegment, but of easier fusion than the pieces to be joined, and then exposing them to such a heat as will fuse the cementing ingredient and make the pieces aglutenate without being themselves fused. A glass for the purpose of cementing broken pieces of flint glass may be made by fusing some of the same kind of glass previously reduced to powder along with a little red lead and borax.

CEMENT FOR SPAR, AND OTHER STONES.

A cement for this purpose may be made with about seven or eight parts of resin, and one of bees wax, melted together, with a small quantity of plaster of Paris. If it is wished to make the cement fill up the place of any small chips that may have been lost, the quantity of plaster must be increased a little.—When the ingredients are well mixed and the whole is nearly cold, the mass should be well kneaded together. The pieces of spar that are to be joined, must be heated until they will melt the cement and then pressed together; some of the cement being previously interposed. Melted sulphur applied to fragments of stones previously heated by placing them before a fire, to at least the melting heat of

sulphur, and then joined with the sulphur between makes a pretty firm and durable joining. Little deficiences in the stone, as chips out of corners, &c. may also be filled up with melted sulphur in which some of the powder of the stone has been melted.

BLOOD CEMENT.

A cement often used by copper smiths to lay over the rivets and edges of the sheets of copper in large boilers to serve as an additional security to joinings, and to secure cocks &c. from leaking, is made by mixing pounded quick lime with ox's blood. It must be applied fresh, as it soon gets hard. If the properties of this cement were duly investigated it would probably be found useful for many purposes to which it has never yet been applied.

FLOUR PASTE.

Flour paste for cementing is formed principally of wheaten flour, boiled in water till it is of a glutinous or viscid consistence. It may be prepared of these ingredients simply, for common purposes, but when it is used by book binders, or for paper hangings, it is usual to mix with the flour a fifth or sixth of its weight of powdered resin, or alum, and where it is wanted still more tenacious, gum arabic or any kind of size may be added.

JEWELLER'S CEMENT, FOR SETTING PRECIOUS STONES WHEN PIECES ARE BROKEN OFF BY ACCIDENT.

In such cases the artist can frequently join the broken pieces so correctly, that an inexperienced eye cannot discover the stone to have been broken; for this purpose a small piece of gum mastick is applied between the fragments which are previously heated sufficiently to melt the interposed gum. They are then pressed together to force out the redundant gum.

TURKEY CEMENT FOR JOINING GLASS, METALS, &C.

Dissolve five or six bits of mastick as large as peas in as much spirit of wine as will suffice to render it liquid; in another vessel dissolve as much isinglass which has been previously soaked in water till it is swollen and soft, in brandy or rum as will make two ounces by measure; of strong glue and add two small bits of gum galbanum or amoniacum, which must be rubbed or ground till they are dissolved, then mix the whole with a sufficient heat, keep it in a phial stopped and when it is to be used, set it in hot water.

TO CEMENT BROKEN CHINA, GLASS, &C.

Take quick lime and white of eggs, grind

and temper them well together and it is fit for use. Drying oil and white lead are also frequently used for cementing china and earthern ware, but this cement requires a long time to dry. Where it is not necessary the vessel should endure heat or moisture, isinglass glue with a little trippoli or chalk is better.

CEMENT, USEFUL FOR TURNERS.

Take resin one pound, pitch four ounces, melt these together and while boiling hot add brick dust until by dropping a little upon a stone you perceive it hard enough, then pour it into water and immediately make it up into rolls and it is fit for use: or take resin one ounce, pitch two ounces, add red ochre finely powdered, until you perceive it strong enough. Sometimes a small quantity of tallow is used, according to the heat of the weather, more being necessary in winter, than summer.—Either of these cements, are of excellent use for turners. By applying it to the side of the chuck and making it warm before the fire you may fasten any thin piece of wood which will hold while you turn it, when you want it off again strike in on the top with your tool, and it will drop off immediately.

A STRONG CEMENT.

Melt one pound of resin in a pot or pan over a slow fire, add thereto as much plaster

of Paris in fine powder as will make it hard enough, which you will soon know by trial, then add a spoonful of linseed oil, stirring it all the while, and try if it be hard enough for your purpose: if it is not sufficiently hard enough, add more plaster of Paris, and if not tough enough, add more linseed oil. This is as good cement as possible for fixing the necks of cylinders or any thing else that requires to be strongly fixed, for it is not easily melted again when cold. Or take resin one pound, beeswax one ounce, add thereto as much red ochre as will make it of sufficient stiffness, pour it into water, and make it into rolls and it is fit for use. This cement is useful for cementing hoops on glasses, or any other mounting of electrical apparatus.

SHELLAC CEMENT.

This is a very strong cement for holding metals, glass or precious stones, while cutting, grinding, or turning them. The metal &c. should be warmed to melt it. For fastening ruby cylinders in watches and similar delicate purposes shel lac is excellent.

A CEMENT THAT WILL STAND AGAINST BOILING WATER AND THE PRESSURE OF STEAM.

In joining the flanches of iron, cylinders, and other parts of hydraulic and steam engines, great inconvenience is often experi-

enced from the want of a durable cement.—Boiled linseed oil, litharge, and red and white lead mixed together to a proper consistence, and applied on each side of a piece of flannel, previously shaped to fit the joint, and then interposed between the pieces, before they are brought home as the workmen term it, to their place by the screw or other fastenings employed, make a close and durable joint. The quantities of the ingredients may be varied without inconvenience, only taking care not to make the mass too thin with oil. It is difficult in many cases instantly to make a good fitting of large pieces of iron work, which renders it necessary sometimes to join and separate the pieces repeatedly before a proper adjustment is made. When this is expected the white lead ought to predominate in the mixture, as it dries much slower than the red. A workman knowing this fact can be at little loss in exercising his own discretion in regulating the quantities. It is safest to err on the side of the white lead as the durability of the cement is no way injured by it, only a longer time is required for it to dry and harden.—When the fittings will not admit easily of so thick a substance as flannel being interposed, linen may be substituted, or even paper or thin pasteboard. This cement answers well for joining broken stones, however large.—Cisterns built of square stones put together with this cement will never leak or want any repairs. In this case, the stones need not be

entirely bedded in it;—an inch or two or even less, of the edges that are to lie next the water, need only to be so treated, the rest may be filled with good lime mortar.

ANOTHER CEMENT THAT WILL STAND THE ACTION OF BOILING WATER AND STEAM.

This cement which is preferable even to the former for steam engines, is prepared as follows: take two ounces of Salamoniac, one ounce of flour of sulphur, and sixteen ounces of cast iron filings or borings. Mix all well together by rubbing them in a mortar and keep the powder dry. When the cement is wanted for use, take one part of the above powder and twenty parts of clean iron borings or filings and blend them intimately by grinding them in a mortar. Wet the compound with water, and when brought to a convenient consistence apply it to the joints with a blunt or wooden spattula. By a play of affinities which those who are at all acquainted with chemistry, will be at no loss to comprehend, a degree of action and reaction takes place among the ingredients, and between them and the iron surfaces, which, at least causes the whole to unite as one mass. In fact, after a time, the mixture and the surfaces of the flanches become a species of pyrites holding a very large proportion of iron, all the parts of which cohere strongly together.

JAPANESE CEMENT.

This elegant cement is made by mixing rice flour intimately with cold water and then gently boiling it. It is beautifully white and dries almost transparent. Papers pasted together by means of this cement will sooner separate in their own substance than at the joining, which makes it useful in the preparation of curious paper articles that require layers of paper to be cemented together.

CEMENT FOR STOPPING HOLES OR CRACKS IN IRON.

Take six quarts of potter's clay, one part steel filings, and of linseed oil sufficient quantity to render the mixture of a substance like glazier's putty.

CEMENT.

Take two parts common wood ashes sifted fine, three parts of clay powdered fine, one part of sand sifted fine, and all mixed well together with linseed oil, resists the inclemencies of the weather when dried, better than marble.

CEMENT.

Isinglass boiled in spirits of wine will produce a fine transparent cement, which will

unite broken glass so as to render the fracture almost imperceptible and perfectly secure.

JAPPANNING.

When a priming is used, the work should first be prepared, by being well smoothed with fish skin or glass paper, and being thoroughly clean, should be brushed over once or twice with hot size, diluted with two thirds water if it is of the common strength. The priming should then be laid on as soon as possible, and should be formed of a size of a consistency between the common kind and glue mixed with as much whiting as will give it a sufficient body of colour to hide the surface of whatever it is laid upon, but no more. This must be repeated till the inequalities are completely filled up, and then the work must be cleaned off with Dutch rushes, and polished with a wet rag. When wood or leather is to be jappanned and no priming is used, the best preparation is to lay two or three coats of coarse varnish composed in the following manner. Take rectified spirits of wine one pint, and of coarse seed lac and resin, each two ounces, dissolve the seed lac and resin in spirit, and then strain off the varnish. This varnish, as well as all others formed of spirits of wine, must be laid on in a warm place; and if it can be completely managed, the piece of work to be varnished, should be made warm likewise, and for the same reason, all dampness should be

avoided, for either cold or moisture chills this kind of varnish, and prevents its taking proper hold of the substance on which it is laid.—When the work is so prepared or by the priming with the composition of size, and whiting above described, the proper jappan ground must be laid on, which is much the best formed of shellac varnish and the colour desired except white, which requires peculiar treatment, and if brightness is wanted, then also, other means must be pursued. The colours used with the shellac varnish, may be any pegments whatever, which give the tint of the ground desired. As metals never require to be undercoated with whiting they may be treated in the same manner as wood or leather.

METHOD OF PAINTING JAPPAN WORK.

Jappan work ought properly to be painted with colours in varnish, though for the greater despatch, and in some very nice work too small for the use of the pencil, the colours are sometimes tempered in oil which should previously have a fourth part of its weight of gum ammi dissolved in it, or in default of that gum, sandarack or gum mastick. When the oil is thus used, it should be well diluted with oil turpentine that the colours may lie more evenly and thin, by which means fewer of the polishing or upper coats of varnish become necessary. In some instances water colours are

laid on grounds of gold in the manner of other paintings; and are best when so used in their proper appearance without any varnish over them; and they are also sometimes so managed as to have the effect of bossed work.—The colours employed in this way for painting are best prepared by means of isinglass size, corrected by honey or sugar candy. The body of which the embossed work is raised, need not however be tinged with the exterior colour, but may be best formed of a very strong gum water thickened to a proper consistence by bole Armenian and whiting in equal parts which being laid on the proper figure, and repaired when dry, may be then painted with the proper colours tempered with the isinglass size, or in the usual manner, with shellac varnish.

MANNER OF VARNISHING JAPPAN WORK.

The finishing of jappan work depends on the laying on and polishing the outer coats of varnish which are necessary as well in the pieces that have only one simple ground of colour, as with those that are painted. This in general, is done best with common seed lac varnish except in the instances and on those occasions where particular methods are deemed to be more expedient, and the same reasons which decide as to the fitness or impropriety of the varnishes with respect to the colours of the ground, hold equally with re-

gard to those of the painting. For where brightness is the most material point and a tinge of yellow will injure it, seed lac must give way to the whiter gums; but where hardness and a great tenacity are most essential, it must be adhered to, and when both are necessary, it is proper one should give way to the other in a certain degree reciprocally, a mixed varnish must be adopted. This mixed varnish as we have already observed should be made of the pricked seed lac. The common seed lac varnish which is the most useful preparation of the kind hitherto invented may be thus made. Take of seed lac three ounces and put it into water to free it from the sticks and filth that are frequently intermixed with it, and which must be done by stirring it about and then pouring off the water, and adding fresh quantities in order to repeat the operation till it is freed from all impurities, (as is very effectually done by this means.) Dry it then and powder it grossly and put it with a pint of rectified spirits of wine into a bottle of which it will not fill above two thirds, shake the mixture well together and place the bottle in a gentle heat till the seed lac appears to be dissolved the shaking in the mean time repeated as often as may be convenient, then pour off all that can be obtained clear by this method, and strain the remainder through a coarse cloth. The varnish thus prepared, must be kept for use in a bottle well stopped. When the spirit of wine is very strong it will dissolve

a greater proportion of the seed lac, but this quantity will saturate the common which is seldom of a strength sufficient to make varnishes in perfection. As the chilling which is the most inconvenient accident attending varnishes of this kind, is prevented or produced more frequently according to the strength of the spirit; we shall therefore take this opportunity of showing a method by which weaker rectified spirits may with great ease at any time be freed from the phlegm, and rendered of the first degree of strength. Take a pint of the common rectified spirits of wine and put it into a bottle of which it will not fill above three parts, add to it half an ounce of pearl ashes, salt of tartar, or any other kind of alkaline salt, heated red hot and powdered as well as it can be without much loss of its heat. Shake the mixture frequently for the space of half an hour before which time a great part of the phlegm will be separated from the spirit and will appertain together with the undissolved part of the salts in the bottom of the bottle. Let the spirit be poured off, freed from the phlegm and the salts by means of a tritoreum or separating funnel, and let half an ounce of the pearl ashes, heated and powdered as before be added to it, and the same treatment repeated. This may be done a third time if the quantity of phlegm separated by the addition of the pearl ashes appears considerable. An ounce of allum reduced to powder and made hot, but not burnt, must

then be put into the spirit and suffered to remain some hours, the bottle being frequently shaken after which the spirit being poured off from it, will be fit for use. The addition of the alum is necessary to neutralize the remains of the alkaline salt which would otherwise greatly deprave the spirit with respect to varnishes and lacquer where vegetable colours are concerned, and must consequently render another distillation necessary. The manner of using the seed lac or white varnish is the same, except with regard to the substance used in polishing, which where a pure white of a great clearness of other colours is in question, should be itself white, whereas the brown sorts of polishing dust as being cheaper and doing their business with greater despatch may be used in other cases. The piece of work to be varnished should be placed near a fire or in a room where there is a stove, and made perfectly dry, and then the varnish may be rubbed over them by the proper brushes made for that purpose, beginning in the middle and passing the brush to one end, and then with another stroke from the middle passing it to the other. But no part should be crossed, or twiee passed over in forming one coat when it can be possibly avoided.—When one coat is dry another must be laid over it, and this must be continued at least five or six times or more, if on trial there is not sufficient thickness of varnish to bear the polish without laying bare the painting or ground

colour underneath. When a sufficient number of coats is thus laid on, the work is fit to be polished, which must be done in common cases by rubbing it with a rag dipped in tripoli or rotten stone finely powdered, but towards the end of the rubbing, a little oil of any kind should be used along with the powder, and when the work appears sufficiently bright and glossy, it should be rubbed with the oil alone, to clean it from the powder and give it a still brighter lustre.

JAPPANER'S GILDING.

The gilding of jappanned work consists in drawing with a hair pencil in gold size, the intended ornaments and afterward applying gold leaf or gold powder. The gold size may be prepared in the following manner. Take of linseed oil and of gum animi four ounces, set the oil to boil in a proper vessel and then add the gum animi gradually, in powder, stirring each quantity about in the oil till it appears to be dissolved, and then putting in another, till the whole is mixed with the oil. Let the mixture continue to boil, till on taking a small quantity out, it appears of a thicker consistence than tar, and then strain the whole through a coarse cloth and keep it for use—but it must, when applied, be mixed with vermilion and oil turpentine. Having laid on the gold size and suffered it to dry, the gold leaf is applied in the usual way; or if it is

not wanted to shine so much, gold powder is applied which is made by grinding gold leaf with honey, and afterwards washing the honey away with water. If the gilding is to be varnished over, Dutch gold may be used or arummusivium may be used instead of real gold powder.

TO WRITE ON PAPER WITH LETTERS OF GOLD.

Put some gum arabic into common writing ink and write with it in the usual way. When the writing is dry, breathe on it; the warmth and moisture will soften the gum and cause it to fasten on the gold leaf which may be laid on in the usual way and the superfluous part brushed off; or instead of this, any Japanner's size may be used.

OIL GILDING.

First prime your work with boiled linseed oil and white lead, and when that is dry cover it over with a thin coat of gold size made of stone ochre ground in fat oil. When that is so dry as to feel clammy to the fingers, or to be what the gilders call tacky, it is fit for gilding. Having spread your leaves upon the cushion, cut them into slips of the proper width for covering your work. Then breathe upon your tip which by moistening, it will cause it to take up the leaves from the cushion. Having applied them by the tip, on the

proper parts of your work, press them down with the ball of cotton. When all your work is sufficiently covered let it dry and clean it off with the brush. This sort of gilding is the easiest and least expensive, and stands the weather best, and may be cleaned with a little water any time, but wants in the lustre of burnished gilding.

BURNISHED GILDING.

The wood intended to be gilded in this manner, should first be well sized and then covered with seven or eight coats of size and whiting so as to form a body of considerable thickness. Having got a sufficient quantity of whiting upon the work, it must be carefully cleaned taking care to free all the cavities and hollows from the whiting that may have choked them up and by proper moulds and tools restoring the sharpness of the mouldings intended to be shown. It is then to receive a coat of size which is made by boiling Armenian bole with parchment size. This must also remain till it is sufficiently dry for gold. It must not be quite dry, therefore it would not be prudent to lay on more at a time than can be gilded before it becomes too dry. The work being thus prepared, place it a little declining from you, and having ready a cup of clean water, and some hair pencils, moisten a part of the work and then apply the gold by the tip to the moistened part. The gold will imme-

diately adhere close to the work, proceed to wet the next part and apply the gold as before, repeating this operation till the whole is completed, taking care not to let any drops of water come upon any part of the gold already laid on. Care should therefore be taken that no part be missed in going over it at first.—The work being thus gilt let it remain twenty four hours, when the parts that are designed to be burnished are polished with a dogs tooth or what is better with an agate burnisher.—The gilding must not be quite dry when burnished.

AN IMPROVED PROCESS FOR GILDING IRON OR STEEL.

This process which is less known than it ought to be among artists, may prove useful to those who have occasion to gild iron or steel. The first part of the process consists in pouring a solution of gold in nitro muriatic acid, about twice as much ether, which must be done with caution, and in a large vessel.—These liquids must then be shaken together, as soon as the mixture is then at rest, the ether will be seen to separate itself from the aqua regia, and to float on the surface. The aqua regia becomes more transparent and the ether darker than they were before, for the reason that the ether has taken the gold from the acid. The whole mixture is then to be poured into a glass funnel, the lower aperture

of which should be small, but this aperture must not be opened till the fluids have completely separated themselves from each other. It is then to be opened; by which means, the liquid which has taken the lowest place by its greater gravity (viz.) the nitro muriatic acid, will run off, after which the aperture is to be shut, and the funnel will then be found to contain nothing but ether mixed with the gold which is to be put into well closed bottles and preserved for use. In order to gild iron or steel the metal must be first well polished with the finest emery, or rather with the finest crocus martes or colcothar of vitrol and common brandy. The auriferous ether is then to be applied with a small brush; the ether soon evaporates and the gold remains on the surface of the metal. The metal may be then put into the fire and afterwards polished. By means of this auriferous ether, all kinds of figures may be delineated, on iron by employing a pen or brush. Instead of ether, the essential oils may be used, such as oil of turpentine, or oil of lavender, which will also take gold from its solution.

GRECIAN GILDING.

Dissolve some mercury in muriatic acid which will give a muriate of mercury, mix equal parts of this and salamoniac and dissolve them in aquafortis. Put some gold into this and it will dissolve. When this is applied to

silver, it becomes black, but by heating, it assumes the appearance of gilding.

TO MAKE SHELL GOLD.

Grind up gold leaf with honey in a mortar, then wash away the honey with water and mix the gold powder with gum water. This may be applied to any article with a camel hair pencil in the same way as any other colour.

OF THE INSTRUMENTS NECESSARY FOR GILDING.

The first instrument is the cushion for receiving the leaves of gold, from the books in which they are bought. It is made by covering a board of about eight inches square with a double thickness of flannel, and over that a piece of buff leather and fastening light round the edges. The knife for cutting the leaves should be made like a pallet knife and should not have its edge too sharp. The tip is a tool made by fastening the long hairs of a squirrel tail between two cords and is used for taking up the gold leaf after it is cut. A ball of cotton is necessary for pressing down the leaf after it is laid on. A large camel hair brush is used for dusting the work and clearing away the superfluous gold.

MORDANTS FOR COLOURING.

The most important part of dyeing is un-

doubtedly the proper choice, and the proper application of mordants; as upon them the permanency depends. They must previously be dissolved in some liquid which has a weaker affinity for them, than the cloth has to which they are to be applied, and the cloth must be dipped or steeped in this solution in order to saturate itself with the mordant. Almost the only substances used as mordants are earths, metalic oxides, tan and oil. Of earthy mordants the most important and most generally used is alumina. Alum when used is dissolved in water and very frequently a quantity of tartar is dissolved along with it. Into this solution the cloth is put and kept in it until it has absorbed as much alumina as is necessary, it is then taken out and for the most part washed and dried. Acetite of alumina has been but lately introduced into dyeing. This mordant is now prepared by pouring acetite of lead into a solution of alum; a double decomposition takes place, the sulphureous acid combines with the lead, and the compound precipitates in the form of an insoluble powder, while the alumina combines with the aceteous acid, and remains dissolved in the liquid. This mordant is employed for cotton and linen which have a weaker affinity than wool for alumina. It answers much better than alum; the cloth is more easily saturated with alumina, and takes in consequence, both a richer and more permanent colour. Lime is sometimes used as a mordant, but in general it does

not answer so well as alumina. When used, it is either in a state of lime water or of sulphate of lime dissolved in water. Almost all the metalic oxides have an affinity for cloth, but only two of them are extensively used as mordants; namely the oxides of tin and iron. Tin is used as a mordant in three states: dissolved in nitro muriatic acid, in aceteous acid, and in a mixture of sulphuric and muriatic acid. Nitro muriatic of tin is the common mordant employed by dyers. They prepare it by dissolving tin and diluted nitric acid to which a certain proportion of muriate of soda, or of amonia is added. When the nitro muriate of tin is to be used as a mordant, it is dissolved in a large quantity of water, and the cloth is dipped in the solution and allowed to remain till sufficiently saturated. It is then taken out and washed and dried. Tartar is usually dissolved along with nitro muriate.—The consequence of this is a double decomposition. The nitro muriatic acid combines with the potass of the tartar while the tartareous acid dissolves the oxide of tin. When tartar is therefore used in any considerable quantity, the mordant is not a nitro muriate but a tartrite of tin. Iron may be used as a mordant in two states, in that of sulphate of iron, and acetate of iron. The first is commonly used for wool. The salt is dissolved in water and the cloth dipped in. It may be used also for cotton, but in most cases acetite of iron is preferred. It is prepared by dissolving iron or

its oxide in vinegar or sour beer, and the longer it is kept the better. The reason is that this mordant succeeds best, when the iron is in a state of red oxide. It would be better than to oxidate the iron or convert it into rust before using it. Tan has a very strong affinity for cloth, and for several colouring matters, it is therefore very frequently employed as a mordant. An infusion of nutgalls or sumach or any other substance containing tan is made in water, and the cloth is dipped in this infusion and allowed to remain till it has absorbed a sufficient quantity of tan. Silk is capable of absorbing a very great proportion of tan, and by that means requires a great increase of weight. Manufacturers sometimes employ this method of increasing the weight of silk.—Tan is often employed also, along with other mordants in order to produce a compound mordant. Oil is also used for the same purpose in the dyeing of cotton and linen. The mordants with which tan most frequently is combined are alumina and oxide of iron.—Besides these mordants there are several other substances frequently used as auxiliaries either to facilitate the combination of the mordant with the cloth, or to alter the shade of colour. The chief of these are tartar acetite of lead, common salt, salamoniac, sulphate of copper. Mordants not only render the dye permanent, but have also considerable influence on the colour produced. The same colouring matter produces very different dyes

according as the mordant is changed. Suppose for instance, that the colouring matter is cochineal, if we use the aluminous mordant, the cloth will acquire a crimson colour; but the oxide of iron produces with it a black.—Indigo has a very strong affinity for wool, silk, cotton, and linen. Every kind of cloth therefore may be dyed with it without the assistance of any mordant whatever.

MURIO SULPHATE OF TIN.

This preparation differs somewhat from the muriate of tin or nitro muriate of tin. It is prepared as follows. Take six ounces of muriatic acid and pour it upon the same weight of tin granulated in a glass vessel. Then pour slowly upon the same, four ounces of sulphuric acid, and let it stand in a warm place till the acids saturate themselves with tin; that is, till they will dissolve no more, which will soon be effected if heat be applied, and gradually, without being heated.

NITRO MURIATE OF TIN MORE PARTICULARLY DESCRIBED.

It is prepared in the following manner.—Melt block tin and pour it into water, briskly agitated with a bundle of small rods, take of this granulated tin two ounces, nitric acid one pound, one half pound common salt, or salammoniac two ounces, mix them well togeth-

er in a glass vessel and the tin will be slowly dissolved. When common salt which is composed of muriatic acid, and soda or salamoniac composed of the same acid, and amonia, is mixed with diluted nitric acid, a part of the nitric acid seizes on the soda or amonia and setting at liberty a part of the muriatic acid, forms nitro muriatic acid (aqua regia) which will dissolve tin or gold.

A TURKISH BLUE.

Take two and a half ounces cochineal, ten ounces aquafortis, one and a half of English tin, and a quarter of a pound of alum. The silk must be coloured in a keep to a medium blue. This being done, take a kettle containing ten buckets of water; put into it two and a half ounces of cochineal, and boil it well for the space of ten minutes. During the above process, dissolve the tin in the aquafortis according to art. This being done, pour the solution, together with a quarter of a pound of alum, into the above mentioned kettle with ten buckets of water. Stir this liquor well, and immerse the silk in the liquor; work it well therein, for about three quarters of an hour—during which time it must be kept at a steady, slow, continued boil; then take it out, rinse it, wring it, fix it on the wringing post, wring and beat it well, which will restore it to its natural gloss again.

Note. If you do not like to use the aqua-

fortis in the above process, you may substitute a quarter of a pound of cream of tartar, and increase the quantity of alum from a quarter to half a pound.

A HANDSOME GREEN.

Take two pounds of alum, and four pounds of quercitron bark. Take for this purpose, a kettle with eight buckets of water, and dissolve in it, two pounds of alum, then pour it into the tub and set it by, until it is wanted. While you are engaged in preparing this solution, the silk must be coloured in a cold keep to a handsome light blue; and after being rinsed in a stream, wring and steep it in the above mentioned alum liquor; work well therein, for two hours; then take it out, wring it, and lay it by, for further use. Lastly, put four pounds quercitron bark into a kettle containing eight buckets of water; boil it well for the space of three quarters of an hour, and pour the liquor through a sieve into a tub. At the same time, and while this is doing, prepare an incorporation of indigo and oil vitrol, (the proportions are nine or ten parts of vitrol to one of indigo, at a temperature of 100 degrees,) and pour the same into the quercitron liquor in the tub, and stir the whole well. Into this compounded liquor, steep the silk, and work well therein for the space of half an hour, then take it out, wring and dry it. In case the silk has not attained

as handsome a green as desired, add a small quantity of tumerick to the yellow liquor, which will have the desired effect.

MIXTURE OF BLUE AND YELLOW.

This forms green which is distinguished by dyers into a variety of shades, according to the depth of the shade, or the prevalence of either of the component parts. Thus, we have pea green, grass green, sea green, &c. Wool and linen are usually dyed green, by first giving them a blue colour, and afterwards dying them yellow; because, when the yellow is first given, several inconveniences follow—the yellow partly separates again in the blue vat, and communicates a green colour, and thus renders it useless for every other purpose except dyeing green. Any of the usual processes for dyeing blue and yellow, may be used, taking care to proportion the depth of the shades to that of the green required.—When sulphate of indigo is employed, it is usual to mix all the ingredients together, and to dye the cloth at once. This produces what is known by the name of Saxon or English green.

MIXTURE OF BLUE AND RED.

These form different shades of violet, purple, and lilac. Wool is generally dyed blue, and afterwards, scarlet in the usual manner.

By means of cochineal, mixed with sulphate of indigo, the process may be performed at once. Silk is first dyed crimson by means of cochineal; and then dipped into the indigo vat. Cotton and linen are first dyed blue, then galled and soaked in a decoction of logwood.

MIXTURES OF YELLOW AND RED.

These produce orange. When blue is combined with red and yellow on cloth, the resulting colour is olive. Wool may be dyed orange by first dyeing it scarlet and then yellow. When it is first dyed with madder, the result is cinnamon colour. Silk may be dyed orange, by means of carthamus, a cinnamon colour, by logwood, brazil wood, and fustick, mixed together. Cotton and linen receive a cinnamon colour, by means of weld and madder, and an olive colour, by being passed through a blue, yellow, and then a madder bath.

MIXTURES OF BLACK WITH OTHER COLOURS.

These constitute greys, drabs, and browns. If cloth is previously combined with brown oxide of iron, and afterwards dyed yellow with quercitron bark, the result will be a drab of different shades according to the proportion of mordant employed. When the proportion is small, the colour inclines to olive, or yellow; on the contrary, the drab may be deepened or saddened, by mixing sumach with the bark.

TURKEY RED.

First impregnate the stuff with murio sulphate of tin, and afterwards dyeing it in a bath composed of four parts of cochineal, and four parts quercitron bark. To give the colour more body, both the mordant and the dye may be repeated. A colour approaching scarlet may also be given, by first dyeing in crimson, then dyeing it with carthamus, and lastly, yellow, without heat. Cotton and linen are dyed red with madder. The cloth is first impregnated with oil; then with galls, and lastly, with alum; it is then boiled for one hour in a decoction of madder, which is commonly mixed with a quantity of blood; after the cloth is dyed, it is plunged into a soda ley in order to brighten the colour. The red given by this process is very permanent and beautiful. The best colouring matters, employed for dyeing red, are kermes, cochineal, archil madder, carthamus and Brazil wood. None of the red colouring matters have so strong affinity for cloth as to produce a permanent red, without the assistance of mordants. The mordants employed, are alumina and oxide of tin; oil and tan in certain processes are also used, and tartar and muriate of soda are frequently called in as auxiliaries.

DYEING BLUE.

Take of indigo well powdered one ounce, quick lime one ounce, potash two ounces, mo-

lasses half a pint, warm water one gallon.—Mix and stir occasionally, keeping the vessel of copper, iron, or earthern, well covered in a warm place. The liquor will soon become green, covered with a copper coloured, or blue scum; in twenty four hours, it will be fit for use. Immerse the stuff to be coloured, for a longer or shorter time, according to the shade required. The strength of the colour may also be varied, by using a greater or less quantity of water. A very little practice will enable any one to give wool, silk, or cotton, properly prepared, with this dye, a beautiful and permanent blue of any shade they may choose.

SAXON BLUE.

In this method, the indigo is dissolved by the aid of sulphuric acid without losing its blue colour, but it undergoes a change, which renders it less permanent, and is therefore, not used except for articles not very durable, or when a deep unfading tint is not considered of much importance. This preparation is kept in the shops, under the name of liquid blue, or chemical blue, and is much used for blueing white cotton, and linen garments, for which it is readily washed out even in cold water. It is also extensively used in colouring greens, giving with yellow a more brilliant colour, than the blue obtained by the first method. On wool and silk it is much more durable than on cotton; and on articles which do not require

frequent washing, may be often used advantageously as a blue dye. It is prepared as follows. Take indigo one ounce, well powdered, sulphuric acid four ounces, mix it in a glass or stone ware vessel, and let it stand twenty four hours, stirring it occasionally; then add one ounce dried potash. Let it stand twenty four hours longer, add half a pint of water, and bottle it up for use. Mix a wine glass full of this liquid in a pail full of boiling water, and dip the stuffs till they acquire the colour desired. More of the liquor must be added when the water becomes nearly clear, before the stuffs have acquired a colour sufficiently deep.

BLUE FOR COLOURING SILK.

The quantity of the necessary ingredients for this colour, must be regulated according to the quantity of the silk to be coloured.—Take filings of copper free from all alloy of other metals; it is best, therefore, to rasp or file them, yourself, in order to obtain them pure. Put these into a glass vessel, pour spirits of salt, sufficient to cover them twice as deep, as the space they occupy; let them stand twenty four hours, or as long as necessary for the spirits of salt to obtain a blue or green colour. Then pour off the clear part of the coloured spirits of salt into another glass vessel and add fresh spirits of salt to the copper filings, and continue this process until the

whole of the copper filings have been dissolved, when nothing but the earthy and impure parts will remain. Mix all these several blue, or deep green coloured solutions of copper, and add thereto as much spirits of amonia as will be necessary to saturate the mixture. Then moisten the silk in warm water, but be careful to do this in such a manner, that all parts will be completely soaked in the water, then wring it, and steep in the blue tincture, prepared as above directed, work therein until it has attained a handsome ultramarine colour, then take it out, wring well, rinse it in a stream, and dry it in the shade. By minutely observing the above process, you will obtain a very handsome blue colour.

DARK BLUE FOR SILK.

Take one and a half ounces of indigo, twelve ounces of oil vitrol, one pound and a quarter of alum, four pounds of logwood.—The greatest attention and accuracy in the process of dyeing this colour, is necessary.—Before you proceed to the dyeing, prepare a solution of indigo, in oil vitrol, in the following manner. Powder very finely and sift one and a half ounces of indigo, and put three quarters of a pound of oil of vitrol in a stone jar; add the pulverized indigo to it; stir the whole well, with an earthern pipe stem, or some similar earthern article, and continue the stirring until the oil of vitrol ceases to fer-

ment; the mixture having become quiet, set it by for the space of twenty four hours; at the expiration of this time, a little water must be added, and the whole matter stirred again, by which it will receive new life and vigour; after which, it must be set away undisturbed until it is to be applied to the dyeing of the silk. After this, prepare a kettle, with eight buckets of water, put into it one and a quarter pounds of alum, and dissolve it completely therein. This being done, pour the solution into a pail, steep the silk in the solution, and work it well therein for an hour. After which, take it out, wring it, and lay it by in its wet state for further use. This being done, put eight buckets of water in a kettle, pour the solution of indigo into it, and mix it well by stirring: work the silk well in this blue liquor, for the space of half an hour, then take it out and rinse it in running water, wring it, and lay it by, in its wet state for further use. By this process, the silk will receive a handsome light blue colour. To deepen this blue, or to change it to a dark blue, take a kettle with sixteen buckets of water and bring it to a boiling heat, then put into it four pounds logwood and boil it well for about three quarters of an hour; then take out one half of the liquor and run it through a sieve into a tub; let the other half remain in the kettle for further use; put into the liquor, in the tub, a quarter of a pound of alum, which has previously been dissolved in some vessel; stir the whole well; steep the

light blue silk in it, and work it well, in the liquor, a quarter of an hour, then take it out, wring it, and keep it in its wet state, for further use, and throw out the liquor as useless. Lastly, pour into another vat, the remaining eight buckets of the logwood liquor, left in the kettle, after first having run it through a sieve; steep the silk in the liquor and work it well, for the space of half an hour; then take it out, rinse it in running water, wring and dry it.—By the above process, you will obtain a dark blue, equal to any of the blues which have been coloured by means of the keep. The above blue is likewise applicable to the dyeing of any other goods.

VIOLET BLUE.

Take one ounce indigo, twelve ounces oil vitrol, one quarter pound of alum, four pounds logwood, one pound red wood. The indigo must be dissolved in the oil vitrol, as directed in the foregoing receipt, and kept ready for use. Dissolve in a kettle with eight buckets of water, a pound and one quarter of alum; then pour the solution into a tub and work the silk well therein, for the space of one hour; take it out, wring and keep it in its wet state, for further use. Fill a vat with eight buckets of water; put the above solution of indigo into it; stir the whole well, work the alum dressed silk therein, for the space of half an hour; then take it out, rinse it in running water,

wring it, and set it by for further use. Lastly, take a kettle with eight buckets of water, put into it four pounds logwood, and one pound red wood, and boil the whole, three quarters of an hour; then run the decoction, through a sieve into a vat; steep the blue coloured silk in it, and work it well, for half an hour; take it out, and rinse it in running water,—wring and dry it.

A HANDSOME BLUE.

One part of indigo is to be dissolved in four parts of concentrated sulphuric acid; to the solution, one part carbonate of potash is to be added, and then it is to be diluted with eight times its weight of water. The cloth must be boiled for one hour in a solution, containing five parts alum, and three of tartar, for every thirty two parts cloth. It is then to be thrown into a water bath, containing a greater or smaller proportion of the diluted sulphate of indigo, according to the shade which the cloth is intended to receive. In this bath, it must be boiled till it has acquired the wished for colour. The alum and tartar are not intended to act as mordants, but to facilitate the decomposition of the sulphate of indigo. The alkali, added to the sulphate, answers the same purpose. These substances also, by saturating part of the sulphuric acid, serve in some measure to prevent the texture of the cloth from being injured, by the action of the acid,

which is very apt to happen in this process.—But sulphate of indigo is by no means the only solution of that pigment, employed in dyeing. By far the most common method is to deprive indigo of the oxygen, to which it owes its blue colour, and thus reduce it to the state of green pollen, and then, to dissolve in water, by means of alkalies, or alkaline earths, which in that state, act upon it very readily. Two different methods are employed for this purpose. The first of these methods, is to mix with indigo, a solution of some substance, which has a stronger affinity for oxygen, than the green basis of indigo,—green oxide for instance, and different metalic sulphurates. If therefore, indigo, lime, and green sulphate of iron, are mixed together in water, the indigo gradually loses its blue colour, becomes green and is dissolved; while the green oxide of iron is converted into the red oxide. The manner in which these changes take place, is obvious; part of the lime decomposes the sulphate of iron; the green oxide, the instant that it is set at liberty, attracts oxygen from the indigo, decomposes it, and reduces it to a state of green pollen. This green pollen is immediately dissolved by the action of the rest of the lime. The second method is to mix the indigo in water, with certain vegetable substances which readily undergo fermentation. During this fermentation, the indigo is deprived of its oxygen and dissolves by means of quick lime, or alkali, which is added to the solution.—

The first of these methods, is usually followed in dyeing cotton and linen—the second, in dyeing wool and silk. In the dyeing of wool, woad and bran are commonly employed, as vegetable ferments, and lime, as the solvent of the green base of the indigo. Woad itself, contains a colouring matter precisely similar to indigo, and by following the common process, indigo may be extracted from it. When the cloth is first taken out of the vat, it is of a green colour; but it soon becomes blue, by attracting oxygen from the air. It ought to be carefully washed to carry off the uncombined particles.

LIGHT BLUE FOR SILK.

Silk is dyed light blue, by a ferment of six quarts of bran, six of indigo, six of potass, and one of madder. To dye it of a dark blue, it must previously receive what is called, a ground colour; a red dye stuff, called archil, is used for this purpose.

BLACK.

The substances employed to give a black colour to cloth, are red oxide of iron and tan. These two substances have a strong affinity for each other, and when combined, assume a deep black colour, not liable to be destroyed, by the action of air or light. Logwood is usually used as an auxiliary, because it com-

municates lustre, and adds to the fulness of the black. Cloth before it receives a black colour is usually dyed blue; this renders the colour much fuller and finer. If the cloth is coarse, the blue dye may be too expensive; in that case, a brown colour is given, by means of walnut peels. Wool is dyed black by the following process. It is boiled for two hours in a decoction of nutgalls, and afterwards kept for two hours more, in a bath composed of logwood and sulphate of iron, kept the whole time at a scalding heat, but not boiled; during the operation it must be frequently exposed to the air. The common proportions are five parts of galls, five of sulphate of iron, and thirty of logwood, for every hundred of cloth. A little acetate of copper is added to the sulphate of iron; it is thought to improve the colour continued on cloth, previously coloured blue with indigo, take dried maple bark twelve ounces, or one pound if green, logwood six ounces, elm bark eight ounces, and boil them in two gallons of water for one hour. Take out the bark, immerse the cloth, and boil another hour. Then take five ounces of copperas, dissolve in two quarts of water, and add it slowly to the liquor in the boiler. The cloth should be kept continually turning in the boiling liquor, for two hours. Take it out, cool it, and again soak it in boiling water, to which a small quantity of ox gall has been added, another hour. Rinse it out, and scour it well, with hot water and hard soap. Cloths not

coloured with indigo will take a good black, if the quantity of logwood be increased, and the decoction of the bark, &c. be many times repeated.

BLACK ON SILK.

The fibres of silk, do not so readily receive the black dye as those of wool. What the wool dyer effects by three or four dippings, the silk dyer scarcely obtains from twenty. As the affinity of the silk, for the soluble part of the galls or maple bark, is greater than with iron, it is thought most advantageous to begin by boiling about one half as much in weight of the galls, or bark, as of the silk to be dried, in a suitable quantity of water, for three hours.—Let it settle, pour off the clear liquor, and macerate the silk in the same for twenty four hours. Being dried and slightly rinsed, the silk, if afterwards immersed in solution of the sulphate of copperas moderately warmed, and kept therein, twelve hours; after which, it should be rinsed and immersed in a warm decoction of logwood, for several hours; again immersed in the solution of iron, rinsed again, transferred to the decoction of bark, &c.—repeating these alternate immersions till the desired colour shall have been produced. Iron dissolved in vinegar is still better than copperas. A black vat may be easily prepared for colouring silk, by immersing in vinegar, old iron hoops, turnings of iron, to which may be

added maple bark, sumach, oak, alder bark, &c. and left to undergo a gradual solution.—The longer the liquor is kept, the better. By repeated dippings in black dyes, silk may be made to acquire nearly a fourth part more in weight,than it possessed before its natural gum had been separated by the boiling with soap; a process to which all new silk should be subjected before it is coloured. But the colour produced by this excess of black, is not so good as it is, when no such excess has been employed. As soon therefore, as the silk becomes sufficiently coloured, judging by the eye, it should be rinsed out and passed through a bath, containing at the rate of one pound starch, and half a pound linseed oil, well mixed with six quarts warm water.

YELLOW.

To dye ten pounds of cloth or woollen stuffs, of the highest and most beautiful orange colour, one pound of quercitron bark, and the same weight of murio sulphate of tin, will be required. (This preparation differs somewhat from the muriate of tin,) the method of preparing, is as follows. Take six ounces of muriatic acid, and pour it upon the same weight of tin, granulated as above directed in a glass vessel. Then pour slowly upon the same, four ounces of sulphuric acid, and let it stand in a warm place, till the acids saturate themselves with tin; that is, till they will dis-

solve no more. The bark, powdered and tied up in a bag of thin cotton or linen cloth, may be first put into the dyeing vessel, which of course, must be brass or copper, glass or earthern, with hot water, for the space of six or eight minutes; then the murio sulphate of tin may be added, and the mixture well stirred two or three minutes. The cloth previously wet with warm water may be put in, and turned briskly a few minutes; the colour applies itself in this way, so equally to the cloth, and so quickly, that after the liquor begins to boil, the highest yellow may be produced in less than fifteen minutes, without any danger of its proving uneven. Should a deeper orange tint be desirable, add to the quercitron bark, a little madder, perhaps an ounce to the pound of bark, according to the colour desired.—When a bright golden yellow approaching less to the orange, is wanted, four ounces of the murio sulphate of tin, and two ounces of alum, and one pound of bark, managed in the same manner as above directed. A good yellow may also be produced, by boiling the cloth for one hour, in one seventh of its weight in alum, dissolved in a suitable quantity of water, and then, without being rinsed, put into a dyeing vessel, with clean, hot water, and about as much quercitron bark, tied up in a bag, as was used of alum. Boil and turn it as usual, until it takes sufficient colour; then dip in warm lime water, for ten minutes, and rinse it well, immediately afterwards. Tin however, dis-

solved when used in colouring wool or silk, renders the fibres a little harsh, but this may be in a great measure obviated by employing the murio sulphate of tin, with a mixture of alum, or alum and tartar, and combining these with the colouring particles of the bark, before they are applied to the stuffs. In dyeing silks, more alum and less tin, should be used, than is directed for woollens. To produce a lively yellow on silks, it will be sufficient to boil after the rate of four ounces of bark, three ounces of alum, and two ounces of the murio sulphate of tin, with a suitable quantity of water, for ten or fifteen minutes, and the heat of the liquor being reduced, so that the hand can bear it,—the silk is to be put in, and dyed as usual, taking care to agitate the liquor continually, that the colouring matter may not subside until it has acquired the proper shade.—By adding very small proportions of cochineal to the bark, the colour may be raised to a beautiful orange. A similar effect, though less brilliant, is produced by adding madder to the quercitron.

A HANDSOME YELLOW.

Take one pound and a quarter of alum, twenty pounds of common lady's (St. Mary's) thistle, one half pound of woad ashes. Dissolve the alum in a kettle containing ten buckets of water, pour the solution into a vat, fix your silk upon rods, in the usual way; steep it in

the solution, work it well therein, for one hour, take it, wring it, and lay it aside wet for further use. This being done, put ten buckets of water in a kettle, add the St. Mary's thistle, and boil well for an hour, run the decoction through a sieve, into a pail to separate the coarse from it; let it cool until you will be able to bear your hands in it; steep the silk in the liquor, work well therein, for half an hour; then take it out, wring it, and lay it aside for further use. The pails or vessels, in which you dress the silk with alum, and in which the liquor is, must be filled, and kept full during the process of working it, to within a few inches of the top, and should there be occasion to fill them up, care must be taken not to make it too cool; but preserve it all times, with a degree of heat, in which the hand can barely be held. While this is doing, the St. Mary's thistle must be put into the kettle a second time, with fresh water, and be boiled again. Then take out the silk, dip out some of the liquor in which you had previously worked the silk, and add as much of the liquor of the second boiling to it, as was taken therefrom; so that the first quantity will be preserved. The liquor must now, as well as each time, before you steep the silk in it, be stirred well; then steep the silk in the liquor again, and work it well therein, for half an hour. The liquor may, in this latter process, be made a little hotter than it was in the first, but be cautious, not to make it too hot. During this second

process, the woad ashes are to be dissolved in a kettle into which you have poured some of the liquor of the second colouring, boiling hot; stir the liquor and woad ashes well, and then let it settle. This being done, pour some of the clear part of the solution into the yellow liquor, after having first taken out the silk; stir the whole of it well, steep the silk in it again, and work it well therein, fifteen minutes. At the expiration of this time, or sooner as you may deem it necessary, take out a small quantity of the silk, wring, and examine it, whether it has attained the required colour; should this not be the case, a small quantity of the solution of the woad ashes must be added to the liquor; the silk steeped in it again, and well worked in the same, until the required colour be obtained.

A CITRON YELLOW.

Take one pound and a quarter of alum, eight pounds of safflower. Dissolve the alum in a kettle containing ten buckets of water; then pour the solution into a vat, steep the silk in it, work it well therein, half an hour, wring, and lay it by, in its wet state for further use, and throw away the solution as useless. Put again, ten buckets of fresh water in the kettle, add eight pounds of safflower, and a quarter of a pound of alum; let it boil for half an hour, run the decoction through a sieve, into a vat, steep the silk in the liquor, work it

well therein, a quarter of an hour, wring, and dry it. With the rest of the above liquor, a pale yellow may yet be dyed.

A CITRON YELLOW WHICH MAY BE HEIGHTENED TO A HANDSOME GOLD TINT.

Take one pound and a quarter of alum, fourteen pounds safflower. Put ten buckets of water in a kettle, add one pound and a quarter of alum; dissolve it therein, pour the solution into a vat, and work the silk in the solution for about half an hour, wring, and lay it by in its wet state for further use. This being done, pour ten buckets of fresh water into the kettle, add seven pounds of safflower, and boil it half an hour, pour the liquor through a sieve, into a vat, and work it well therein, for the space of fifteen minutes; then wring and dry it. The yellow liquor is now to be poured back into the kettle, the remaining seven pounds of the safflower to be put into it, together with one quarter of a pound of alum, and the whole to be boiled half an hour; then pour the liquor through a sieve, into a pail, work the silk in the liquor for half an hour, wring, and dry it, and then beat it well. By the above process, a handsome citron colour will be obtained.

A HIGH COLOURED CRIMSON.

Take one pound and a quarter of cochineal, one pound of galls, four ounces of cream of

tartar, and two pounds and a half of Roman alum. Dissolve two and a half pounds of alum in a kettle, with ten buckets of water; pour the clear part of this solution into a vat, immerse the silk in it, and work it well therein, for the space of four hours; then take it out and rinse, in running water, wring it, and lay it by, for further use in its wet state; then put in a kettle containing eight buckets of boiling water, the following articles:—One and a quarter pounds of finely powdered cochineal, one pound of finely powdered gall nuts, and four ounces of cream of tartar. Let the whole boil slowly, for the space of fifteen minutes; cool it with two buckets of water, work it well in the liquor, which must be kept in a continual boil, for the space of one hour and a half; then take it out, rinse it, and let it dry, when the dyeing will be completed.

For a cheaper colour than the foregoing, reduce the quantity of cochineal from one and a quarter pounds to ten ounces, and substitute for the remainder, three pounds of persio; and proceed with these materials, in the same manner as above directed. This colour will differ from that of the first described process, in no other respect, than that it receives somewhat more of a blueish cast.

A HANDSOME CRIMSON.

Take three pounds of Roman alum, half an ounce of argol, half a pound of East India

galls, twenty five ounces of cochineal. Heat eight buckets of rain water in a kettle lukewarm; put it into three pounds of Roman alum, dissolve it therein, take out the solution, and put it into a pail; immerse the silk in the solution, and work it well therein, for the space of eight hours. Take it out at the expiration of this time, wring lightly, and lay it by for further use in its wet state. To complete this colour, heat eight buckets of well or spring water, until it begins to boil; put into it the following articles:—half an ounce of argol, and half a pound of finely powdered East India galls; let the whole of these articles boil well for about ten minutes, and run the liquor through a sieve into a pail; then pour the liquor back into the kettle, and put into it twenty five ounces of pulverized cochineal; let it boil ten minutes more, cool the liquor with half a bucket of water; immerse the silk in this liquor, and work it well therein for the space of two hours; during which time, the liquor must be kept at a continual boil. This being done, take it out, rinse it well, wring it strongly, and dry it. Then take a kettle with ten buckets of spring or well water, and heat it so that you may bear your hand in it: work the silk well in this water, for half an hour, then take it out and wring it and dry it. By this process we obtain a very handsome crimson.

Note. An ounce, instead of half an ounce of argol may be used; but this is left entirely

to the judgment of the dyer, whether found necessary or not. If this crimson be desired less of a red, and not so handsome, proceed with the cochineal; and the quantity prescribed above may be reduced to eighteen ounces. The process must be, in this case, the same as above directed.

A DEEP RED.

Take one pound of fine galls, two pounds and a half of alum, half pound of composition, and five pounds of madder. Put into a kettle eight buckets of water, and one pound of fine galls; let it boil about fifteen minutes, or until the strength is extracted; take it out, run it through a sieve into a vat, steep the silk in this decoction, and work it well therein, for about two hours; after which, take out, rinse, and dry it. Then put into a kettle eight buckets of water, with two and a half pounds of alum, and half a pound of the composition; let these be properly united with the water; pour the liquor into a vat, steep the silk in the solution, and work it well therein, for the space of four hours; take it out, rinse it, and lay it by in its wet state, for further use. Lastly, to complete this colour, put in a kettle ten buckets of water, add five pounds of madder, and work the silk well in this liquor, until it begins to boil; then take it out, rinse it and dry it.

A REAL BROWN.

Take six ounces of annotto, one pound of potash, three pounds of alum, five ounces of fine galls, half an ounce of cream tartar, two ounces of turmeric, and ten ounces of cochineal. Boil a kettle with ten buckets of water, powder six ounces of annotto and put it together, with a pound of potash, into the kettle, boil for a quarter of an hour, pour the liquor through a sieve into a tub, immerse the silk and work it well in the liquor, for the space of two hours; then take it out, rinse, wring, and dry it. After this, pour eight buckets of fresh water into a kettle, add three pounds of alum, and dissolve it therein, then put the solution in a vat, steep the dried yellow silk, and work it well therein, for the space of three hours, then take it out, wring it and lay it by wet, for further use. This being done, prepare a kettle with eight buckets of water, and bring it to boil; put into it ten ounces of cochineal, and let it boil for about ten minutes; then cool the liquor with a bucket of water, and put into it a quarter of a pound of cream of tartar, and two ounces of turmeric, and stir the whole well; then steep the silk, previously alumed, in the liquor, work it well therein, for the space of two hours; during which time, it must be kept in a continual boil. This being done, take it out, rinse it in running water, wring it and lay it by in its wet state for further use. This being done, dye it in a keep,

(dye tub) light or dark, as your taste may suit, or according to the pattern which is laid before you. If you do not wish to make use of the keep, or, as is often the case in small establishments, should you not possess one, you may apply the indigo colouring. You may likewise colour it in the liquor of logwood, which will render it equally handsome, but not of so lasting a colour.

A REAL CRIMSON IN ANOTHER WAY.

Take two pounds and a half of Roman alum, two pounds of fine galls, one pound and four ounces of cochineal, one fourth of a pound of argol, and eight ounces of spirits of ammonia. Take a kettle with eight buckets of water, put into it two pounds of fine galls, and let it boil for a quarter of an hour; run the liquor through a fine sieve into a pail, steep the silk in the liquor, and work it well therein, for the space of four hours; then take it out, rinse it, wring it, and dry it. After this take a kettle with eight buckets of water, and dissolve in it two pounds of Roman alum; pour it into a vat, steep the silk in the solution of alum, and work it well for the space of four hours, in the same; then take it out, wring it and lay it by in a wet state for further use. After this, to complete the colour, take six buckets of water, pour it into a kettle; add one pound and four ounces of fine cochineal, a quarter of a pound of argol, and eight ounces of spirits of ammo-

nia; let all boil well together for about ten minutes, then cool the liquor with two buckets of water; work the silk in it for about two hours, during which time it must be kept boiling continually; then take it out, suspend it on the rods, over a vat, pour the liquor from the kettle into it, and continue to work the silk in the liquor, until it has become cool: then take it out, rinse it, and dry it in the shade. By following the above directions you will obtain a very handsome crimson.

To turn this expensive cochineal liquor to all possible advantage, (for it will still have retained some good colouring matter,) pour the above used alum liquor into it, and heat it again; which will enable you to colour many lighter shades, from the rich peach blossom, down to the lightest lilac colour. Having used it for this purpose, you may take more or less of silk of a yellow ground and colour it in it, which will receive a reddish yellow from it.

A HANDSOME RED.

Take eight ounces of annotto, one pound and a half of potash, two pounds and a half of alum, six pounds of Brazil wood, five buckets of sharp vinegar, and six ounces of composition. Take for this purpose, a kettle with eight buckets of water, and let it boil. While this is doing, powder eight ounces of annotto as fine as possible; then put it, together with one pound and a half of potash, into the above

heated water, let the whole boil well for a quarter of an hour, and pour the liquor through a sieve into a pail. Steep the silk in this potash and annotto liquor, and work it well, for two hours in the same; after which, take it out, rinse it, wring and dry it. Then dissolve one pound and a half of alum in a kettle with eight buckets of water; pour this solution into a pail, fix your silk upon rods, and work well therein for two hours, then take it out, wring and dry it. When the silk is completely dry, steep it in warm water, until it has become properly soaked. Then take it out, wring it, and lay it by in its wet state for further use.—This being done, pour into a vat five buckets of sharp vinegar, and six pounds of Brazil wood, and let it stand for the space of forty eight hours: then take the liquor out of the vat, and pour it into a kettle; let it boil for the space of ten minutes; then take it out, pour it through a sieve into a vat, and throw the parts remaining in the sieve into the kettle again; pour three buckets of water upon it, let it boil well for a quarter of an hour, and pour the liquor thereof to the other Brazil wood liquor in the vat. This being done, pour six ounces of the composition into this liquor of Brazil wood, and stir it well; steep the silk previously soaked in warm water, in the liquor, and work it well for the space of two hours. Examine, at the expiration of this time, whether the liquor still contains any colouring matter: if so, take it out, pour it into the kettle again, work

the silk another time therein, during which, it must be kept moderately warm; then take it out, rinse it in running water, wring it and hang it up to dry. By using eight buckets of vinegar instead of five, the color will be considerably improved, and by dispensing with the composition altogether, the color will become darker. Lastly, if you desire to have this color of a darker and fiery hue, add two pounds of Brazil wood, and one pound of composition, to the above quantity, and proceed in the same way as above directed.

TO COLOUR SILK WITH QUERCITRON, IN ANOTHER WAY.—A CITRON YELLOW.

Take two pounds and a half of alum, one fourth of a pound of sugar of lead,* two ounces of chalk, and three pounds of quercitron. Take a kettle with eight buckets of water, put into it two and a half pounds of alum, and dissolve it therein; then take out the alum liquor, and pour it into a pail, and let it become cold; add to it a quarter of a pound of sugar of lead, and stir it well until united with the solution of alum; then put into it two ounces of chalk, stir it well, and continue the stirring at proper intervals, for the space of twelve hours, and set it by to settle. Pour off the liquor into a pail, but be careful not to disturb the sediment at the bottom; steep the

*Acetate of lead.

silk in the liquor and work it well therein, for the space of six hours; then take it out, wring and lay it by wet, for further use. After this, take a kettle with eight buckets of water, put into it three pounds of quercitron bark, and let it boil for the space of three quarters of an hour; pour it through a sieve into a vat, steep the silk which has been saturated in the foregoing liquor, composed of alum, sugar of lead, and chalk, in the quercitron liquor, and work it well for the space of an hour; then take it out, rinse it, wring and dry it.

If you desire a higher coloured citron yellow than the above, add another pound of quercitron, to the above quantity, and proceed in the following manner. Saturate the silk, as above directed in a liquor of alum, sugar of lead, and chalk; then take a kettle with eight buckets of water, boil two pounds of quercitron therein, three quarters of an hour, and pour the liquor, through a sieve into a vat; steep the silk, and work it well therein, for the space of two hours; after which, take it out, wring and dry it. This will have given the silk the best of grounds for a good yellow colour. After this, take another kettle with eight buckets of water, put into it two pounds more of quercitron bark, and boil it for the space of three quarters of an hour; then pour it through a sieve into a vat, and work the previously coloured and dried silk in the same, for the space of two hours; then take it, rinse and dry it.

COLOURS WHICH ARE USED EITHER IN WATER OR OIL, FOR DRAWING OR PAINTING.—RED LAKES.

This term is used to denote a species of colours formed by the combination of alumnia, or the oxide of tin, with the colouring matters of vegetables. The lakes chiefly used are red colours; and these are of different qualities, according to the basis and colouring matter employed, such as carmine, Florence lake, and madder lake, &c.

CARMINE

Is a very rich, bright crimson colour, and stands well in water. For the preparation of carmine, four ounces of finely pulverized cochineal are to be poured into four, or six quarts of rain, or distilled water, that has been previously boiled in a pewter kettle, and boiled with it for the space of six minutes longer. Eight scruples of Roman alum, in powder, are to be then added, and the whole kept upon the fire one minute longer. As soon as the gross powder has subsided, and the decoction has become clear, it is to be carefully decanted into large cylindrical glasses, covered over and kept undisturbed till a fine powder is observed to have settled at the bottom. The liquor is then to be poured off from this powder, which is to be gradually dried. From the liquor, which is still much coloured, the rest

of the colouring matter may be separated, by means of the solution of tin, when it yields a carmine little inferior to the former.

FLORENTINE LAKE

Is the kind in general use, known by the name of lake. It is used in water, and also in oil, but does not stand, which is much to be lamented, as it is a very beautiful colour, and there is no substitute that will completely answer all the purposes of lake. The best sort may be prepared from the sediment of cochineal that remains in the kettle, after making carmine, adding to it a small quantity of cochineal, or Brazil wood, and precipitating the colouring matter with a solution of tin.

MADDER LAKE

Is very little known as a colour. It is not so bright and rich a colour as the last mentioned lake, but has this valuable advantage, that it stands much better, and may answer many of the purposes of Florence lake. It is prepared nearly in the same manner as the foregoing.

ROSE LAKE.

This is generally called rose pink. It is a lake, made by a basis of chalk, coloured by Brazil, or Campeachy wood. It does not

stand, and is only used for house-painting and paper hanging.

VERMILION

Is a bright scarlet pigment, formed from sulphur and quicksilver; when of a coarse kind, it is called cinnabar. Its goodness is known by its brightness, and its inclining to a crimson hue. It is a very useful colour in oil where it stands very well; but in water, it is apt to turn black.

RED LEAD,

Or minium, is lead calcined till it acquires a red colour by exposing it with a large surface to the fire. It is also made from litharge, which is a calx, or oxide of lead; but is not so good as when made directly from metalic lead. This colour is very apt to turn black, both in water and oil, and is therefore seldom used, but for very coarse purposes.

INDIA RED

Is a very useful colour, answering some of the purposes of lake: it stands well, both in water and oil. It is difficult to procure the genuine kind, which comes from the East Indies. What is sold for Indian red, is said to be chiefly made in England.

VENETIAN RED

Is a native red ochre, rather inclining to the scarlet, than the crimson hue; it is not far different from the common Indian red, but fouler, and is chiefly used by house-painters.

SPANISH BROWN

Is also an earthly substance, found in the same state in which it is used; it is nearly of the same colour as Venetian red, but coarser. It is used only for the commonest purposes.—It does not change.

LIGHT RED, OR BURNT OCHRE.

This is common yellow ochre, heated red-hot in the fire, till the colour changes from yellow to a red. It is a very excellent colour, both in water and oil; having the quality, in common with all the ochres, of standing perfectly well.

RED CHALK.

This is the same substance as is used for drawing on paper, in the manner of a crayon. It is very much like light red, and is used instead of it for some purposes. It stands perfectly well, and may be used both in water and oil.

BURNT TERRA DI SIENNA.

This colour is made by calcining raw terra di Sienna till it acquires a red colour. It is of a very rich tint, and is much used both in water and oil. It stands well in both.

BLUE.

Ultramarine is prepared from lapis lazuli; by calcining and washing it very clean. When genuine, it is an extremely bright blue colour, somewhat transparent, both in oil and water, and stands perfectly well. On these accounts it is of the utmost value, being excellent in every kind of painting, even in enamel: but its great price prevents the general use of it.

ULTRAMARINE ASHES.

This is the residuum, after washing the lapis lazuli, in which a portion of the ultramarine still remains. It is very subject to be adulterated. It is not so bright as ultramarine; being, like that colour, with a tint of red and white in it. When genuine it stands well.

PRUSSIAN BLUE.

This colour is iron combined with a peculiar acid, called the Prussic acid. It is made in the following manner. Two parts of purified potass are most intimately blended with three

parts of dried and finely pulverized bullock's blood. The mass is first calcined in a covered crucible and on a moderate fire, until no more smoke or flame appears; and it is after this, brought to a complete yet moderate ignition; or equal parts of potass and finely powdered coals from bones, horns, claws, &c. are mingled, and heated in a covered crucible to a moderate redness. This done, either of these two calcined masses is, after cooling, lixivated with boiling water, and the lixivium filtered. Nothing remains now but to make a solution of one part of green vitrol and two parts of alum; and to add to it, while yet hot, the above lixivium, little by little however, and to separate the greenish blue precipitate, which there forms, by means of a filter. If afterward, a slight quantity of diluted muriatic acid is affused upon this precipitate, it assumes a beautiful dark blue colour. The operation is terminated by edulcorating and drying pigment thus prepared. Prussian-blue is an extremely beautiful colour, when properly prepared, and stands well. Common Prussian blue is apt to contain some iron, which causes it to turn greenish or olive.

VERDITER

Is a blue pigment obtained by adding chalk or whitening to the solution of copper in aquafortis. The best sort is prepared by refiners; who employ for this purpose the solution of

copper, which they obtain in the process of parting, by precipitating silver, from aquafortis by plates of copper. Common verditer is made from the sulphate of copper, or blue, by the manufacturers in Sheffield and Birmingham. Verditer is only used for coarse purposes chiefly by the paper stainers. It has been sometimes called sanders-blue, from ignorance of the meaning of the term cindres blues, or blue ashes, which the French call it.

INDIGO.

This colour is extracted from a plant that grows in the East and West Indies. It is not so bright as Prussian blue, but it is cooler, and has the advantage of being very durable. It cannot be dissolved by water, but may, by the sulphuric acid, and it then forms Scott's liquid blue, so much used for colouring silk stockings, &c.

SMALT.

This is glass, coloured with cobalt, and ground to a fine powder. Its coarseness prevents its being used much for painting in oil or water. It is employed sometimes by strewing it upon a ground of oil paint. It is also used in enamel painting. It stands well.

Bice is only smalt more finely levigated.

YELLOWS—INDIAN YELLOW.

This is the brightest of all yellow for water colours, and is perfectly durable. It is said to be procured from the urine of the buffalo. In the East Indies it is a very common and cheap colour: the natives there use it commonly for colouring their calicoes, which they do without mordants: so that the colour is washed out again when the cloth is dirty.

KING'S YELLOW.

This colour is orpiment refined; which is a substance dug out of the earth, and consists of sulphur joined to arsenic; or it may be prepared by subliming sulphur with arsenic. It is of a very bright yellow, but does not stand, and great caution should be used in employing it, as it is a strong poison.

NAPLES YELLOW.

This is a very durable and bright yellow; it comes from Naples, and is supposed to be prepared from lead and antimony.

YELLOW OCHRE.

This is an earth coloured by oxide of iron. It is a cheap colour, and not very bright, but is valuable on account of its standing well.—Roman ochre is a superior kind of yellow ochre.

DUTCH PINK.

This pigment is formed of chalk, coloured with the juice of French berries, or vegetables affording a yellow colour. It does not stand and is chiefly used for coarse purposes.

GAMBOGE

Is a gum brought from the East Indies. It readily dissolves in water, and is a fine bright yellow. It is used only in water, and is very serviceable.

MASSICOT

Is an oxide of lead, prepared by calcining white lead. It is very little used, the colour not being very bright.

GALLSTONES.

This is a concretion, or hard substance, formed in the gall-bladders of beasts; or it may be obtained from the gall of animals. It is a very rich colour, but does not stand.

RAW TERRA DI SIENNA

Is a native ocherous earth, brought from Italy. It is a fine warm colour, and stands well.

ORANGE LAKE

Is the tinging part of annatto, precipitated together with the earth of alum. It does not stand.

BROWN PINK

Is the tinging part of some vegetable substance, precipitated upon the earth of alum. It is of a fine rich greenish yellow, but does not stand.

GREEN.

There are few colours that are so useful as greens; accordingly, it is the practice with artists to form their greens by the mixture of blue and yellow colours. By varying these, a vast variety of green tints may be obtained.

SAP GREEN

Is the concreted juice of the buckthorn berries. It is never used in oil. It is employed chiefly in flower painting, colouring prints, &c.

VERDIGRIS.

If plates of copper, moistened from time to time with vinegar, are left exposed to the air, they will be converted into green oxide, called verdigris; this is an imperfect oxide of copper,

combined with a small portion of acetic acid, carbonic acid, and water. It is prepared in large quantities, chiefly in France, near Montpelier, by stratifying copper plates with the husks of grapes yet under vinous fermentation, which soon grow acid and corrode the copper. After the plates have stood in this situation for a sufficient time, they are moistened with water, and exposed in heaps to the air. The verdigris is scraped off from their surfaces as it forms.

Verdigris is of a blueish green colour, but has no body, and does not stand. It is only used for coarse purposes. It answers best when used in varnishes. Distilled verdigris, sometimes called crystals of verdigris is prepared from common verdigris, by dissolving it in vinegar. It is of a very bright green; and is used chiefly for varnishes, and in colouring maps, &c.

BROWN COLOURS.

Bistre is the finer parts, extracted from the soot of burnt wood. It is much used alone for sketches in water colours, being a transparent, warm colour. There is an excellent sort prepared in Ireland.

COLONGE EARTH

Is a mineral substance of a blackish brown colour. It is a very useful colour; though

what is generally sold in the shops for Colonge earth, is an artificial mixture of several colours.

RAW UMBRE

Is a native ocherous earth, of a light brown. It stands well.

BURNT UMBRE

Is only the last mentioned colour, calcined in the fire. It then acquires a rich deep brown, and is of great use, being a fine colour, and standing perfectly well.

ASPHALTUM

Is used in oil, and is a very rich deep brown. It is a transparent or glaring colour. It will not work in water; but when dissolved in turpentine, it becomes a useful substance for giving deep and spirited touches to drawings.

WHITE.

Flake white is an oxide of lead, formed by corroding lead with vegetables, acids or vinegar.

WHITE LEAD

Is the same colour as flake white, only of an inferior quality. It is the only white used in oil painting, and is a very useful colour;

but in water it always turns black, and should never be used.

PURE CARBONATE OF LIME

Is very useful as a white in water colours, as it stands perfectly well. Egg shell white, and oyster shell white, are only egg shells or oyster shells calcined, by which the animal gluten is destroyed, leaving the lime behind, which soon attracts the carbonic acid again from the atmosphere. Well washed Spanish white, or common whitening, answers the same purpose.

BLACK.

Lamp black is the soot of oil, collected after it is formed by burning. It is very generally used, both in oil and water, and stands perfectly well.

IVORY BLACK

Is the coal of ivory or bone, formed by giving them a great heat, while they are deprived of all access of air. It is of more intense black, than lamp-black. Blue black is the coal from burning vine stalks in a close vessel. It is like ivory black, with a tint of blue.

TO MAKE COPAL VARNISH.

Take three pounds of the best West India copal; scrape it as clear from dust, and other impurities as possible, then pound it in a clean iron mortar, till it is as fine as Indian corn; then take half a pound of flint glass, as coarsely pulverized, add the coarsest to the gum, and the fine may be thrown aside. Put these into a copper kettle with a narrow top, place the kettle over a charcoal fire in a patent furnace; continue the heat without intermission till the gum is dissolved; keep the kettle on constantly in motion during the operation of dissolving, which you will perceive by the ebullition subsiding, and the whole has settled down to a liquid (the ebullition will continue till the last particle of gum is dissolved;) previous to the above operation you will have one pint of bleached oil made warm, or a little more than blood warm, and the gum being taken from the fire, the warm oil must be added with a small stream, with constant stirring with a clean iron rod made warm before it is put into the composition. When the oil is thoroughly incorporated with the gum, it must stand a few minutes to cool; when it begins to stiffen you must add gradually two quarts of spirits of turpentine made warm, with constant stirring, then strain the whole through a flannel whilst warm, and bottle it tight for use. After standing a few days to settle, it is fit for use; if too thick for spreading, reduce it with spirits of

turpentine as you make use of it. The above varnish may be made use of for all common work, where it is wanted to dry quick, and is not exposed to the weather; but such as is exposed to the weather, when there is danger of cracking, add one quart of the bleached oil instead of a pint, and spirits the same quantity as above mentioned. If a colorless varnish is wanted to varnish over white, bronzed, or silvered work, you may use the best kind of South American gum, instead of West India gum; and proceed in the same manner as above directed. The white varnish made from the American gum, cannot be applied to the preparation of paints, but ought to be used only where varnish alone is required; it may be used to varnish maps, charts, &c. Varnish made from India gum, though of an amber colour, may be used in all colours, and will run free under the coarse brush, or the fine pencil.

TO MAKE CHINESE VARNISH.

Take of amber coarsely pulverized, one pound, and melt it in a clean iron pot, with a cover closely fitted to the top, with a small hole in the centre with a clean iron rod one end bent in the form of a curve, for the use of stirring the composition; then add two ounces of melted shellac, previously melted in a separate vessel, and ten ounces of drying oil, boiling hot. Incorporate the whole accurately,

by stirring; then remove it from the fire, and let it cool till out of danger of taking fire by the addition of spirits of turpentine; then add a pint of spirits turpentine made warm. This varnish is made use of on furniture of all kinds, where brilliancy and durability are required. It is capable of receiving a high polish.

TO CRYSTALIZE TIN.

Cleanse the tin by washing it with warm water, tinctured with pearl ashes or common soap; then heat the tin to the temperature of bare sufferance to the hand, and pour on it or apply with a brush or sponge a mixture of one ounce of muriatic acid, with one fourth of an ounce of sulphuric acid, and two ounces of water, then immediately wash the tin in clear water. Another method is, to apply in the same manner, a solution of two ounces of muriate of soda, in four ounces of water, with one ounce of nitric acid. In either case, if the crystaline figures are not bold enough, the operation may be repeated; if a very small figure is required, the tin may be heated nearly to flowing and plunged into cold water, slightly acidulated with nitric acid, muriatic acid. If a little solder is drawn over the tin with a hot soldering iron in such a manner as to form a cross or circle, and the opposite of the tin be afterwards crystalized, it will have a beautiful effect. Crystalized tin ought not to

be worked into such vessels as are required to be water tight; the effect that the acids produce on the tin, prevents in some degree, the solder from running free and adhering to the tin; for that reason, crystalized tin is more commonly manufactured into such articles where water tightness is not essential. The tin being ready for jappanning, we will proceed to that business.

TO JAPPAN CRYSTALIZED TIN.

If a transparent yellow is required, make use of one ounce of pulverized turmeric, and half a drachm of the best dragon's blood; infuse them at a moderate temperature, for a week or more, in a pint of rectified alcohol; separate the yellow tincture thus obtained by straining through a piece of clean linen, and add to the clean liquor, three ounces of good gum shellac. Let the materials digest together for several days, in a bottle with frequent shaking; the bottle must be kept warm during the operation; when dissolved, strain off the clear part, which is the lacquer. This lacquer or varnish must be put on warm, and with a soft brush one or two coats, according to fancy.—The lacquer will very soon dry, and ought to be secured with one or two coats of copal varnish, (silver leaf thus treated, will have the appearance of gold,) and dry it in the shade; then let the ornaments be drawn, and when dry, give the work one or two coats of copal

varnish, made from India gum. If a green varnish is wanted, take crystals of verdigris and grind with copal varnish, diluted with spirits of turpentine, on a marble paint stone: that it may flow freely over the tin, lay on two or three coats and dry it in the sun; ornament and varnish with clear copal varnish and dry again, as before. We will now proceed to that kind of jappanning, that requires baking. The tin, that is intended for jappanning, must be entirely free from resin, that is melted on by means of soldering, therefore, sweet oil is commonly used instead of resin. First, lay one coat of varnish, of the following: to one gallon of linseed oil, add half a pound of litharge, and one pound red lead; put all these together, in a five pail iron kettle, over a charcoal fire; give it a steady and strong heat, for three hours, then add gradually, piece by piece, half a pound of gum shellac, and half a pound of asphaltum; keep stirring during the operation, with an iron rod, drop in occasionally, sugar of lead; when the varnish swells and is in danger of boiling over, when the last mentioned gum is dissolved, it may be taken from the fire, and must stand until cold enough to add spirits of turpentine, which may take two or three gallons; and when this is firmly set, lay on a second coat, and when dry, it is ready for baking. If a shaded ground is wanted, strike on very thinly, lamp black, tempered with boiled linseed oil, and spirits turpentine, and when dry, give two coats of varnish of the

last above mentioned, and when dry it is ready for baking. If a tortoise shell is required, take of good linseed oil, one gallon, and of umber half a pound; boil them together, in a clean iron kettle, till the oil becomes very brown and thick; strain it through a coarse cloth, and set it again to boil, in which state, it must be continued till it acquires a pithy consistence, diluted with spirits turpentine. Having thus prepared the varnish, clear well the tin that is to be jappanned, and then lay vermilion, tempered and prepared with drying oil and spirits of turpentine, very thinly on the places, intended to imitate the more transparent parts of the tortoise shell; when sufficiently baked, it changes to a beautiful dark brown, and shows at the same time, the lively shadows of the under ground. I will now give a description of the oven, and afterwards, the manner of baking. The form of the oven is as follows. It may be built of brick, about seven or eight feet square on the inside, and the height about the same; the under floor may be laid with brick or flat stones; the top, or upper floor, may be laid with flat stones, supported by iron bars, laid across from one side of the wall to the other, and all the open spaces made perfectly tight with lime mortar, and over the top of this floor, must be a roof to shed off the rain; at one end, a door must be made, large enough for a person to enter.—This door may be made of plank, and lined with sheet iron, on the inside; at one end, a

small hole must be made, about twelve inches square, and be made in the same end, the door is made in; and a good and lengthy stove must be placed in this oven, and the door of the stove be placed, so as to match with this square hole, that the wood may be thrown into the stove, from the outside of the oven, as the heat will be too great for any person to enter the inside, when once heated. The pipe of the stove, must be turned out at the opposite side from the door, by means of an elbow, that the heat may be more even in the oven. The inside of this oven must be strung with wires in such a position, as to form shelves, about eight or ten inches, one above the other. On these wires or shelves, the tin may be placed for baking, and as the heat of the stove naturally ascends, the tin ought to be placed as high as it is convenient to be placed, if there is not occasion to fill the oven. Having now described the oven, we will now give the process of baking. Take the tin ware in its situation above mentioned, and place it on the wires, one article beside the other, at such a distance apart, as to let the heat between them. Then, begin the fire gradually, and increase it moderately, and after the heat has been continued for the space of one hour, the door may be opened; and after the first flash of heat has subsided, you may walk in and view the work; if any of the tin appears to be placed too near the stove, which may be known by its melting the tin or solder, such articles

must be removed further from the stove. If the jappan should not be dark enough, increase the fire and close the door, and give it another heat, and when the oven cools, take out the tin ; if any particular articles should appear to be slack baked, such articles may be put into the next oven of ware that is to be baked. The work then may be ornamented, and dried by the heat of the sun : when dry, varnish with copal varnish.

NOTE. The whole process of varnishing must be done with a very soft brush, and in a warm room, and clear from dust.

A TRANSPARENT GREEN PAINT INVENTED BY SCHEELE OF SWEDEN.

It is prepared in the following manner.— Dissolve two pounds of blue vitrol in about three gallons of boiling water, in a vessel capable of holding, at least four gallons more.— In another vessel, boil together two pounds of pearlash, and three quarters of a pound of white arsenic, in about two and a half gallons of water ; boil it till the arsenic is dissolved, then pour this last hot solution into the first, while hot. A precipitate will form, which, when collected, washed and dryed, will be the Scheele's green, and will amount to about one fourth of the ingredients, in colour. The above colour may be used in gum water, or oil, and is very beautiful.

TO BLEACH LINSEED OIL.

Take any quantity of linseed oil, put it into a tin vessel that will hold double the quantity of oil that is intended to be bleached; add to the oil clean soft water, till the vessel is filled within one or two inches of the top; set the vessel on the south side of a building, and near the roof that it may be out of the reach of flies, as much as possible, and over the top may be placed a board to serve as a temporary roof; giving a space of three or four inches betwixt the top of the vessel and temporary roof, for the air to circulate free over the oil, and in that situation it must remain undisturbed for three or four weeks; remove it gently from its place, and turn the oil (which will remain upon the top of the water) carefully from the water; at the bottom of the vessel will be found a precipitate that has decended from the oil, which is of no use, and the oil that has been decanted off, will be found to be almost as white, and as limpid as spirits of turpentine, and is the only oil that ought to be used in light coloured varnishes. The oil thus prepared is rendered something of a drying quality, and by adding two ounces of sugar of lead, ground fine in the oil, and shaking it frequently for the space of one week, it will be fit for any kind of painting, and runs much easier under the brush than boiled linseed oil, &c.

Note. For the making of copal varnishes,

acetate of lead may be left out, as it will render the varnish too drying.

TO BOIL OIL FOR PAINTING AND THE PREPARATION OF GOLD SIZE.

To one gallon of linseed oil, in an iron kettle, add four ounces of red lead, and two ounces of litharge; let the heat be gradually increased, till a thick scum arises on the top of the oil; then throw in a few crusts of bread, that are perfectly dry, or a dry cracker; then increase the heat till the oil has become entirely clear, &c.

The preparation of gold size is similar to the above, so far as fitting the oil for painting; the extra process is as follows: Increase the heat to that degree, that the oil will take fire by applying a lighted torch to it, or by throwing a piece of cloth into it, and the cloth then being set on fire, the flame will spread over the surface of the oil. After burning for the space of one minute, the blaze must be extinguished, by covering the pot or vessel tight with a board; then uncover the pot, and apply the fire again, and extinguish as before; repeat the operation till the oil has become thick, and of the consistence of varnish, which may be known by dropping a few drops on some glass or earthern, when it immediately becomes hard and pithy, it is done.

SHAMMY, OR CHAMOIS LEATHER,

A kind of leather, dressed either in oil or tanned, and much esteemed for its softness, pliancy, and being capable of bearing soap without hurt. The real shammy is prepared of the skin of the chamois goat. The true chamois leather is counterfeited with common goat, kid, and even sheep-skin; the practice of which makes a particular profession, called by the French chamoisure. The last is the least esteemed, yet so popular and such vast quantities are prepared, especially about Orleans, Marseilles, and Thoulouse, that it may not be amiss to give the method of preparation.

The manner of chamoising, or of preparing sheep, goat, or kid skins in oil, in imitation of chamois is this:—The skins being washed, drained and smeared over with quick lime, on the fleshy side, are folded in two, lengthwise, the wool outwards, and laid on heaps, and so left to ferment eight days; or if they had been left to dry after flaying, for fifteen days. Then they are washed out, drained, and half dried, laid on a wooden leg or horse, the wool stripped off with a round staff for the purpose, and laid in a weak pit, the lime whereof had been used before, and had lost the greatest part of its force. After twenty-four hours, they are taken out, and left to drain twenty four more; then put into another strong pit. This done, they are taken out, drained and put in again by turns; which begins then to dispose to take

oil, and this practice they continue for six weeks in summer, or three months in winter; at the end whereof they are washed out, laid on the wooden leg, and the surface of the skin on the wool side pulled off, to render them the softer; when made into parcels, steeped a night in the river, in winter more; stretch six or seven over one another on the wooden leg; and the knife passed strongly on the fleshy side to take off any thing superfluous, and render the skin smooth. Then they are stretched as before, in the river, and the same operation repeated on the wool side; then thrown into a tub of water with bran in it, which is brewed among the skins till the greatest part sticks to them; and then separated into distinct tubs, till they swell and rise themselves above the water. By this means, the remains of the lime are cleared out; they are then wrung out, hung up to dry on ropes, and sent to the mill, with the quantity of oil necessary to fill them; the best oil is that of the stock fish. Here they are first thrown in bundles into the river for twelve hours, then laid in the mill trough, and fulled without oil, till they are well softened: then oiled by the hand, one by one, and thus formed into parcels of four skins each, which are milled and dried on cords a second time, then a third; then oiled again and dried. This process is repeated as often as necessity requires; when done, if there is any moisture remaining, they are dried in a stove, and made up in parcels wrap-

ped up in wool; after sometime, they are opened to the air, but wrapped up again as before, till such time as the oil seems to have lost all its force, which it ordinarily does in twenty four hours. The skins are then returned from the mill to the chamoiser to be scoured: which is done by putting them into a lixivium of wood ashes, working and beating them in it with poles, and leaving them to steep till the lye has had its effect; then wrung out, steeped in another lixivium, wrung again, and this repeated till all the grease and oil is purged out. They are then half dried, and passed over a sharp edged iron instrument, placed perpendicularly in a block, which opens, softens, and makes them gentle: lastly they are thoroughly dried and passed over the same instrument again, which finishes the preparation, and leaves them in the form of chamois.

Kid and goat skins are chamoised in the same manner as those of sheep, excepting that the hair is taken off without the use of lime, and that when brought from the mill they undergo a particular preparation called ramalling, the most delicate and difficult of all the others. It consists in this, that as soon as brought from the mill they are steeped in a fit lixivium; taken out, stretched on a round wooden leg, and the hair scraped off with the knife; this makes them smooth, and in working casts a fine nap. The difficulty is in scraping them evenly.

INK.

Take eight ounces of Aleppo galls in coarse powder, four ounces of logwood in thin chips, four ounces green copperas, three ounces of gum arabic in powder, one ounce of blue vitrol, and one ounce of sugar candy. Boil the galls and logwood together, in twelve pounds of water, for one hour, or till half the liquid has been evaporated, strain the decoction through a hair sieve, or linen cloth, and then add the other ingredients, Stir the mixture till the whole is dissolved, more especially the gum, after which, leave it to subside for twenty four hours. The following will also make good ink. To one quart soft water, add four ounces of galls, one ounce of copperas, roughly bruised, and two ounces gum arabic.

RED INK.

Take of the raspings of Brazil wood, a quarter of a pound, and infuse them two or three days in vinegar. Boil the infusion for an hour over a gentle fire, and afterwards filter it while hot. Put it again over the fire, and dissolve in it, first half an ounce of gum arabic, and afterwards, of alum and white sugar, each half an ounce.

SYMPATHETIC INK.

Dissolve some sugar of lead in water, and

write with the solution. When dry, no writing will be visible; when you wish it to appear, wet the paper with a solution of alkaline sulphuret.

TO MAKE A FINE LIQUID BLUE FOR PAINTING ON VELVET AND PAPER.

Put into a large common phial or some other glass vessel, one ounce of Prussian blue, reduced to powder, and pour over it an ounce of concentrated muriatic acid, the mixture produces an effervescence, and soon assumes the consistence of thin paste. Leave it in this state for twenty four hours, then dilute with eight or nine ounces of water, and preserve the colour in a bottle well stopped for use, and gum water made from gum tragacanth may be added to reduce it. This colour, applied to wood as a stain, and secured with varnish, would form a beautiful foil, &c.

MURIATE OF GOLD

Is formed by dissolving gold in nitro muriatic acid. Gold or silver powder or bronze, is prepared in different ways. The first and simplest is to put into a glass or wedge wood mortar, or a clean marble stone, some gold or silver leaves with a little honey or molasses, and grind the mixture for a considerable time, till the gold is reduced to extremely minute particles. When this is done, add to it some

warm water that is soft, in a bowl or glass tumbler, and wash out the glutinous substance, leaving the gold or silver powder behind; decant off the water and repeat the operation, till the water remains clear; then gradually dry the gold or silver powder in the same vessel on a warm stove or in the hot sun clear from dust.

TEETH AND AGE OF THE HORSE.

The horse has forty teeth; twenty four double teeth or grinders, four tushes or single teeth, and twelve front teeth or gatherers.—Mares in general have no tushes. The black marks or cavities, which denote the age, are to be found in the corner front teeth, adjoining the tushes. Horned cattle have similar marks in the tush. At four years and a half old, the mark teeth are just visible, above the gums, and the cavity is very conspicuous. At five the horse sheds his remaining colt's teeth, and his tushes appear. At six, his tushes are up and appear white, small, and sharp; near which is observable, a small circle of young growing flesh: the horse's mouth is then complete, and the corner teeth filled up. At seven years old the two middle teeth fill up. At eight the black marks vanish, and the horse's mouth is said to be full and himself aged.

TO STAIN PAPER OF ANY COLOUR.

Paper or parchment may be stained in the following manner. Yellow, by means of a wash made of French berries, boiled with a little alum; but a more beautiful may be made from a tincture of turmeric, obtained by infusing an ounce or more of the powdered root of turmeric, in a pint of spirits of wine, which may be made so as to give any tint of yellow, from the palest straw colour to the deep and full colour, called French yellow, and will be equal in brightness to the finest dyed silk. If the color be wished of a redder or warmer cast, approaching orange colour, annatto or dragon's blood must be added to the wash, in such proportion as to give the shade required. The best method of using this, or any colour for staining paper or parchment, is to spread them evenly over the surface, by means of a broad brush, or sponge in the manner of varnishing. A green colour is made by a solution of verdigris in vinegar, or chrystals of verdigris, dissolved in water; also, by a solution of the filings of copper, in aquafortis, or spirit of salt being gradually added to either. Blues are made by first staining the paper green, according to any of the above methods, and then using a solution of pearlashes; or by preparing indigo with soap lyes, in the manner commonly used by dyers; brushing it over hot, and afterwards using a solution of an ounce and a half of white tartar, in a pint of water.

before it is quite dry. Orange colour is made by means of the turmeric root, as above directed for the yellow, and afterwards brushing it over with a solution of fixed alkaline salt, made by dissolving half an ounce of pearlashes or salt of tartar, in a quart of water, and filtering the solution.

LACQUERS,

Are varnishes applied upon tin, brass, and other metals. The basis of lacquer is a solution of the resinous substance called seed lac, in spirits of wine. The spirit ought to be very much concentrated in order to dissolve much of the lac. For this purpose some authors direct dry potass to be thrown into the spirit.—This alkali attracts the water with which it forms a liquid, that subsides distinctly from the spirit at the bottom of the vessel. From this liquid the spirit may be separated by decantation. By this method, the spirit is much concentrated; but at the same time it becomes impregnated with part of the alkali, which depraves its colour, and communicates a property to the lacquer, of imbibing moisture from the air. These inconveniences may be prevented by cleansing the spirit from the alkali, by adding to it some calcined alum; the acid of which uniting with the alkali remaining in the spirit, forms with it a vitriolated tartar, which not being soluble in spirits of wine, falls to the bottom, together with the

earth of the decomposed alum. To a pint of the purified spirit, about three ounces of the powdered shellac are to be added, and the mixture to be digested during the same day with a moderate heat. The liquor ought then to be poured off, strained and cleared by settling. This clear liquor is now fit to receive the required colour from certain resinous colouring substances, the principal of which are gamboge and annotto; the former giving a yellow colour, and the latter an orange. In order to give a golden colour, two parts of gamboge are added to one of annotto; but these colouring substances may be separately dissolved in the tincture of lac, and the colour required may be adjusted by mixing the two solutions in different proportions. When silver leaf or tin is to be lacquered, a larger quantity of the colouring materials is requisite, than when the lacquer is intended to be laid on brass.

LACQUER VARNISH.

Take one quart of the strongest brandy and mix it in one pound of calcined tartar; let the brandy stand upon the tartar, for one day, in a gentle heat; then strain it through paper.—Or thus, take one pint of brandy, six ounces of amber, six ounces of gum sandarack, two ounces of shellac. Mix these together, and place the vessel in an iron pot filled with sand, which may be gradually heated. On putting

the vessel into the sand, add another pint of brandy, and frequently shake the vessel until the gums are dissolved; then bottle for use.

ANOTHER LACQUER VARNISH.

Take one ounce and a half of clear cyprus turpentine, two ounces gum mastick, and one ounce gum sandarack; powder the gums and add two ounces of oil spikenard, one ounce oil turpentine, and set them in a kettle of hot sand; when dissolved, filter for use.

NOTE. This is proper for laying over all ground, where transparency is required.

A VARNISH FOR PLASTER OF PARIS, TO GIVE THE APPEARANCE OF MARBLE.

Take fine white Alicant or shaving soap, and scrape it fine; put it into a glazed earthern pot, with a little warm water, and stir it until it becomes milky; cover it from the dust, and let it stand eight days, and it will acquire the consistence of fine varnish. Your varnish thus made, take a soft brush, rather short in the hand, and brush the plaster over with it gently, and set the plaster in a place to dry, free from dust; then gently rub it over with a piece of soft linen, placing yourself between it and the light, that you may see how it takes the polish. When this is done, let it dry, and it will have the appearance of marble.

ENAMELLING.

The art of laying enamel upon metals, such as gold, silver, copper, &c. and of melting it at the fire, or of making divers curious works in it, at a lamp. Enamel is a kind of coloured glass, used in enamelling and painting in enamel. Enamels have, for their basis, a pure chrystal glass, or frit ground up with a fine calx of lead and tin, prepared for the purpose with the addition usually, of white salt of tartar. These ingredients, baked together, are the matter of all enamels, which are made by adding colours of different kinds in powder, to this matter, and melting or incorporating them together, in a furnace. For white enamel, managenese is to be added to the matter, which constitutes the basis; for azure, zaffer mixed with calx of brass; for green, calx of brass with scales of iron; for black, zaffer with managenese and tartar; for red, managenese or calx of copper and red tartar; for purple, managenese with calx of brass; for yellow, tartar and managenese. In making these enamels, the following general cautions are necessary. First, that the pots must be glazed with white glass, and must be such as will bear the fire; secondly, that the matter of enamels must be very nicely mixed with the colours; thirdly, when the enamel is good and the colour well incorporated, it must be taken from the fire, with a pair of tongs; fourthly, the general way of making the coloured enam-

els, is this: powder, sift and grind, all the colours very nicely, and first mix them with one another, and then, with the common matter of enamels, then set them in pots, in a furnace, and when they are well mixed, cast them into water; and when dry, set them into the furnace again, and when melted, take a proof of it. If of too deep a colour, add more of the common matter of enamels, and if too pale, add more of the colours. Enamels are used either in counterfeiting or imitating precious stones; in painting in enamel, or by enamellers, jewellers, and goldsmiths, in gold, silver, and other metals.

THE METHOD OE PAINTING IN ENAMEL.

This is performed on plates of gold, or silver, or most commonly, of copper, enamelled with the white enamel, which they paint with colours melted in the fire, where they take a brightness and lustre like that of glass. This painting is the most prized of all, for its peculiar brightness and vivacity, which is very permanent; the force of its colours not being effaced or sullied with time, as in other painting, and continuing always as fresh as when it came out of the workman's hands.

Very fine enamelling should only be practised on plates of gold; nor must the plate be made flat, for in such case, the enamel cracks; to avoid which, they usually forge them a little round, or oval and not too thick. The plate

being well and evenly forged, they usually begin the operation by laying on a couch of white enamel, on both sides, to prevent the metal from swelling and blistering; and this first lay serves for the ground for all the other colours. The plate being thus prepared, they begin at first, by drawing out exactly, the subject to be painted, with red vitrol, mixed with oil of spike, marking all parts of the design very lightly, with a small pencil. After this, the colours (which are to be previously ground with water in a mortar of agate, extremely fine, mixed with oil of spike somewhat thick,) are to be laid on, observing the mixtures and colours that agree to the different parts of the subject. When the colours are all laid, the painting must be gently dried, over a slow fire, to evaporate the oil, and the colours afterward melted, to incorporate them with the enamel, making the plate red hot in a fire, such as the enamellers use. Afterwards, that part of the painting must be passed over again, which the fire has any way effaced, strengthening the shades and colours, and committing it again to the fire, observing the same method as before, which is to be repeated till the work is finished.

ENCHASING, INCHASING, OR CHASING,

Is the art of enriching and beautifying gold, silver, and other metal work by some design, or figures, represented thereon, in low releivo.

Enchasing is practised only on hollow thin works, as watch cases, cane heads, tweezer cases, &c. It is performed by punching, or driving out, the metal to form the figure from the inside, so as to stand out prominent from the plane or surface of the metal. In order to do this, they provide a number of fine steel blocks, or puncheons of different sizes; and the design being drawn on the surface of the metal, they apply the inside upon the heads or tops of these blocks, directly under the lines or parts of the figures; then with a fine hammer, striking on the metal, sustained by the block, the metal yields and the block makes an indenture or cavity on the inside, corresponding to which, there is a prominence on the outside, which is to stand for that part of the figure. Thus the workman proceeds to chase and finish all the parts by successive application of the block and hammer to the several parts of the design. And it is wonderful to observe with what beauty and justness, by this simple piece of mechanism, the artists in this line, will represent foliages, grotesques, animals, histories, &c.

MEZZOTINTO ENGRAVING, OR SCRAPING.

Mezzotinto prints are those which have no patching, or strokes of the graver, but whose lights and shades are blended together, and appear like a drawing in Indian ink. They are different from aquatinta; but as both re-

semble Indian ink, the difference is not easily described. Mezzotinto is applied to portraits and historical subjects. The tools necessary for mezzotinto scraping, are the grounding tool, burnishers and scrapers. To lay the mezzotinto ground, lay your plate with a piece of flannel under it, upon your table; hold the grounding tool in your hand, perpendicularly; lean upon it moderately hard, continually rocking your hand in a right line, from end to end, till you have wholly covered the plate in one direction; next, cross the stroke from side to side; afterwards, from corner to corner, working the tool each time, all over the plate, in every direction, almost like the points of a compass, taking all possible care not to let the tool cut, (in one direction,) twice in a place. This done, the plate will be full, or in other words, all over rough alike, and would, if it was printed, appear completely black. Having laid the ground, take the scrapings of black chalk, and with a piece of rag, rub it over the plate. Now take your drawing, and having rubbed the back with red chalk dust, mixed with flake white, proceed to trace it on the plate. To form the lights and shadows, take a blunt needle and mark out the outlines only; then, with a scraper, scrape off the lights in every part of the plate, as clean and smooth as possible, in proportion to the strength of the lights in your drawing, taking care not to hurt your outlines. When your plate is ready for taking a proof, or impression, send it to

the copper-plate printer, and get it proved.—When the proof is dry, touch it with white chalk, where it should be lighter, and with black chalk where it should be darker; and when the print is retouched, proceed as before, for the lights, and for the shades, use a small grounding tool, as much as you judge necessary to bring it to a proper colour; and when you have done as much as you think expedient, prove it again; and so proceed, to improve and touch, till it is entirely to your mind.

ETCHING ON GLASS.

Glass resists all the acids except the fluoric acid. By this, however, it is corroded in the same manner as copper is by aquafortis, and plates of glass may be engraven in the same manner as copper. There are several methods of performing this. We shall first describe the mode of etching with fluoric acid. Having covered over the glass, to be etched, with a thin coat of white bleached beeswax, draw the design upon it, in the same manner as in etching on copper. Then take some fluor spar, commonly called Derbyshire spar; pound it fine, and put it into a leaden vessel, pouring some sulphuric acid over it. Place the glass with the etched side lowermost, over this vessel, two or three inches above it. Apply a gentle heat to the leaden vessel; this will cause the acid to act upon the fluor spar, and

disengage the gas, which will corrode the glass. When it is sufficiently corroded remove the wax by oil of turpentine.

ANOTHER WAY.

The etching may be also performed, by raising a margin of bordering-wax all around the glass, in the same manner as on copper, and pouring on the liquid fluoric acid, which acts upon the glass. A third method of etching on glass, is as follows:—Having put the wax on the glass, draw your design and raise a margin all round it. Then put pounded fluor spar with some sulphuric acid, diluted with water upon the glass. The sulphuric acid will disengage the fluoric, which will be absorbed by the water and corrode the glass.

BLANCHING.

Blanching is performed by heating the pieces on a kind of peel, with a wood fire in the manner of a reverbatory; so that the flame passes over the peel. The pieces being sufficiently heated and cooled again, are put successively to boil in two pans, which are of copper; in these they put water, common salt, and tartar. When they have been well drained of this water, in a copper sieve, they throw sand and fresh water over them, and when dry, they are well rubbed with towels.

MARBLING,

Is the painting any thing with veins and clouds, so as to represent those of marble.—Marbling of books, or paper, is performed thus. Dissolve four ounces of gum arabic, in two quarts fair water, then provide several colours, mixed with water in pots or shells, and with pencils, peculiar to each colour, sprinkle them by way of intermixture, upon the gum water, which must be put into a trough, or some broad vessel; then with a stick, curl them or draw them out in streaks to as much variety as may be done. Having done this, hold your book or books close together, and only dip the edges in, on the top of the water, and colours very lightly; which done, take them off, and the plain impression of the colour in mixture, will be upon the leaves; doing as well, the ends as the front of the book in like manner. Marbling books on the cover, is performed by forming clouds with aquafortis, or spirit of vitrol, mixed with ink, and afterwards glazing the covers.

TO STOP CRACKS IN STOVES.

Ashes, salt, plaster of Paris, a small quantity of iron filings, made into a paste with water, about as thick as tar, and applied to the crack, when the stove is cool, and when dried, will be sound and durable.

TAN—TANNING.

Tan is bark ground fine, to be used in the tanning of leather. Tan exists in a great number of vegetable substances, particularly, in the bark of the old white oak, and in the young white oak, and in almost all kinds of oak, hemlock, birch, beech, sumach leaves, and sticks of one year's growth, &c. It is from the skin of animals, that leather is formed, and the goodness of the leather, and its strength, depend in some measure, on the toughness of the hides. The process by which the skins of animals are converted into leather, is called tanning. It seems to have been known, and practised in the earliest ages. It is to the tan, that leather owes its insolubility, and its power of resisting putrefaction. When hides are to be tanned, the first step, (if dry,) is to make them perfectly soft, by working them on a beam, or otherwise, until they are as soft as when taken from the creature, in order to free them from hair; there are various ways, such as smoking, or sweating, or steeping them in water, until they begin to putrefy—all the above ways are used in England. But I should think the surest process to be, to lay them down in lime, or handle them in lime, until the hair will easily come off. When they are deprived of the hair, and well soaked and worked on the hair and flesh side, there are three ways in which they prepare these hides in England, for tanning, called lime cord,

sledge bend, and vitrol bend; all of which are for sole leather.

LIME CORD.

After the hides are deprived of their hair, they are put into a strong lime with about half a bushel of salt, to about forty sides, and handled about twelve days; at which time, the hides will become considerably increased in thickness. They are then taken out and rinsed in clear water, and well worked on the hair and flesh side, and then laid away in bark liquor, and thus tanned.

SLEDGE BEND.

This kind of leather is made, by first preparing a vat sufficiently large to contain the hides, you intend to work therein; having filled your vat about half full of clear water, put in as much rye meal as will make a good ferment; put in your bides and handle them in this liquor, until they are raised to such thickness as you choose; they are then taken out, rinsed and worked on the flesh and grain, and laid away in bark liquor, with good fine bark.

VITROL BEND.

After your hides are well soaked and worked on the flesh and hair sides, proceed to

handle them in a weak solution of bark, three days or until they are well coloured on the grain side; then prepare a vat sufficient to contain the hides you intend to put in, fill it about half full of clear water, put into the vat two ounces of sulphuric acid to each side; then stir it well, and plunge your hides into the lixivium and keep continually stirring them for two hours, then draw them out, and if you wish your hides more raised, or made thicker, you may add two ounces more of the acid; stir them as before mentioned, until they are of a thickness that best suits. When done, have ready a vat to lay them away, and a liquor made as follows;—fill five vats of bark, containing sixty bushels each; begin by letting water on the first, and with a pump, take it from that and so on, until you get the fifth vat filled; then pump this liquor into your vat, prepared for your hides; then lay your hides in, and put a small quantity of bark between each hide, and they may lie in this liquor two weeks, when they are to be taken out and the same process of barking continued; let them lay one month, and proceed as before; observe at this time of laying, to put into your liquor, eight quarts of salt, and ten pounds of alum, powdered fine.

UPPER LEATHER.

Upper leather, and skins, after being limed and well worked down in a grainer, made of

hen or pigeon dung, and once worked on the grain and flesh side, in clear water, will be in a fit state to receive the tan. The sides or skins ought then to be handled in a weak solution of bark, until they are well coloured on the grain, which will take perhaps, six days. Then, if the leather is intended to be sold after it is tanned, the best method will be to make ready a vat about half full of clear water, and put into this water one ounce of sulphuric acid to each side, and handle them in this liquor, ten hours; if skins, one ounce to eight skins; after being thus handled, have ready a good strong liquor from leached bark, with the addition of four pounds of common salt, and two pounds of alum, to thirty sides or sixty skins. And if continued in a good strong liquor, and handled sixty days, (remembering always to continue the alum and salt as aforesaid,) the sides will be quite tanned; but it is recommended to lay them away for about one month, in bark, in the following manner:—put the grain of two sides together, without any bark, and put the bark upon the flesh side, and so continue until your vat is full. Upper leather, tanned in this way, will weigh when dried, fifteen per cent more than the common way of tanning; and much more bright on the grain side. The author has tanned Calcutta hides by the above process, in twenty six days, without laying them away in bark, and they proved by wear, to be of the first quality.—Skins tanned by the above process, are hand-

somer and will weigh considerably more than by the usual process.

TO SOFTEN DRY HIDES.

Put twenty pounds of potash into a vat, and fill up the vat with clear water sufficiently to contain thirty hides; and after the potash is dissolved, stir up the liquor well, and put in your hides, and they will be fit to work in a few days; and by once working them on the beam, will be as soft as if fulled or ground; and by adding five pounds more of potash, you may soften forty hides more, and so on for a greater number.

WHITE LEATHER.

Take three times the quantity of common salt, made fine, to one of sulphuric acid, put into such quantity of water as will contain the number of skins you intend to dress; your skins being first prepared as for bark, and in two days time, will be fit to hang up and dry. Finished, the same as alum dressed.

TO SOFTEN STEEL FOR ENGRAVING.

Steel immersed in lye ten days, made of white oak ashes, becomes soft and fit for engraving.

SPIRIT OF SOAP FOR SHAVING.

Pound an ounce of Castile soap, with about a quarter of an ounce of salt of tartar, in a marble mortar, to which add gradually, half a pint of lavender water. Incorporate the whole together, strain it, and keep the whole in phials, closely stopped. When wanted for use, let a few drops fall into a spoonful of water, and rub the mixture into a lather. This will be found far superior to any common soap.

PRUSSIAN BLUE AS RECOMMENDED BY DR. JOHN PRNNINGTON.

Mix six pounds of pounded burnt black bones, with one pound of potash; press these ingredients closely into an iron pot, and cover it well with an iron cover, well plastered with moistened clay; expose the pot to a bright red heat for three or four hours; then cool gradually, and take out the ingredients; dissolve the soluble parts in hot water, and strain through flannel. If the blue be desired of the very first quality, pour into the liquor, either spirits of salt, or oil vitrol, until the effervescence ceases on the fresh addition of the spirit of oil;—pour the whole into a solution of green vitrol, made by dissolving half a pound of copperas, in two gallons of water. If a light kind of blue is wished, add a less quantity of spirit of salt, or oil of vitrol to the liquor from the bones; in which case, add a quarter

of a pound of alum to the solution of green vitrol; then mix a little of the two liquors together, as before,—at the instant of mixing the two liquors, which before were colourless and transparent, the mixture becomes of a deep blue. In a few hours, the fecula subsides and bears a transparent liquid on the top, which must be gently poured off and thrown away. The sediment must be stirred up with clean hot water and suffered again to subside; this must be repeated; then strained through paper, and what remains on the paper, must be dried on a cake of chalk.

GOLD LACQUER.

Take of Spanish annatto two ounces, two ounces of shellac, one ounce of gum mastick, one pint of rectified spirits of wine. Mix them and let them stand, until all are dissolved.

SILVER LACQUER.

Take of cream of tartar two ounces, of calamine stone prepared two ounces, gum sanders one ounce. Dissolve them in half a pint of spirits of wine.

SMITH'S BEST BLACK INK.

Take of copperas half a pound, gum arabic half a pound, powdered galls one and a half pounds, alum two ounces, rain water six quarts, vinegar half a pound.

TO MAKE MAHOGONY.

It has been contrived to render any species of wood, of a close grain, so nearly to resemble mahogony in the texture, density, and polish, that the most accurate judges are incapable of distinguishing between this happy imitation, and the native produce. The first operation as now practised, in France, is to plane the surface, so as to render it perfectly smooth ; the wood is to be rubbed with a solution of nitrous acid, which prepares it for the materials subsequently to be applied. Afterwards, one ounce and a half of dragon's blood, dissolved in a pint of spirits of wine, and one third of that quantity of carbonate of soda, are to be mixed together, and filtered, and the liquid in this thin state, is to be rubbed, or rather laid on the wood, with a soft brush.—This process is repeated with very little alteration, and in a short interval afterwards, the wood possesses the external appearance we have described. When this application has been properly made, the surface will resemble an artificial mirror ; but if the polish becomes less brilliant, by the use of a little cold drawn linseed oil, the wood will be restored to its former brilliancy.

STAINING IVORY, BONE, HORN, &C. RED.

Take one gallon of lime water, made by pouring on a quantity of quick lime, so much

water as when poured off, the clear liquor will be one gallon; add to this, half a pound of Brazil wood, cut fine; boil them together, for one hour, and let them stand twenty four hours. Then put in your ivory, bone or horn, prepared first by boiling in alum water, and continue boiling, until sufficiently coloured.—If intended for crimson, it may be rendered more red, by dipping it again in alum water.

STAINING IVORY, BONE, OR HORN, BLACK.

Take of litharge and quick lime, each an equal quantity; put them into a pan over a hot fire, and pour so much rain water, as will not boil over; when the liquor boils, put in your ivory, bone, or horn, and stir it well with a clean stick. When you see it take the colour, take your pan from the fire, and stir it constantly until the liquor is cold.

BROWN WATER COLOUR.

Take the smooth ripe shells of the buck eye, or horse chesnut; reduce them to a coarse powder, and boil them several hours, in water; next, filter the liquor through flannel, and let it stand until the colouring particles subside. Then carefully pour off the clear fluid and dry the sediment. Even in this simple manner, the decoction affords a beautiful brown colour, but is considerably improved, on adding a small portion of gum arabic.

GERMAN WAX FOR POLISHING MAHOGANY.

Cut into small pieces, a quarter of a pound of yellow wax, and melting it in a pipkin, add one ounce of well pounded black resin, boiled in water, and afterwards dried; these being both melted, pour in by degrees while yet warm, two ounces spirits turpentine; when the oil is thoroughly mixed, pour it off into a tin or earthern pot, and keep it covered for use. The method of applying it, after well cleaning and dusting the furniture is by spreading a little piece of it on a woollen cloth, and rubbing the wood well with it; in a few days the gloss will be as firm and as fast as varnish.

A VARNISH FOR COLOURED PRINTS OR DRAWINGS TO GIVE THEM THE APPEARANCE OF OIL PAINTINGS.

Take balsam of fir, one ounce, and two ounces of spirits of turpentine; mix them well together. Before applying this composition, the print or drawing should be well sized with a solution of fish glue, and suffered to remain until perfectly dry; the varnish should then be laid on carefully with a soft brush.

A FINE GREEN PAINT, FOR OIL OR WATER.

A durable green pigment was, for a long time, a desideratum among painters. M. Kinman, a member of the Swedish Academy, at

length, discovered and published the following process. Dissolve in separate vessels, a portion of zinc in aquafortis, and a portion of cobalt, strongly calcined in aqua regia, until the liquors are completely saturated. When both solutions are prepared, mix two parts of the latter with one part of the former; then procure a hot and clarified solution of potash, three parts of which, will be required to precipitate the mixture above described. After it has subsided, the fluid part should be gently poured off, and the sediment evaporated to dryness, over a slow fire until it assumes a green colour; before this pigment can be used, it ought to be repeatedly washed with filtered water. Thus it will become fit, both for oil, and water colours, as it is sufficiently fixed to stand the effects of the air and sun, and the inventor has ascertained its superior durability by more than ten year's experience. He adds, that painters may, by this composition, combine their yellow and ultramarine, so as to form a very beautiful and permanent green colour.

OINTMENT FOR THE SCAB, &C. IN SHEEP.

Rub together in a mortar, one pound of quicksilver, and half a pound of Venice turpentine, till the globules of the quicksilver disappear; then add half a pint of oil turpentine, and four pounds hog's lard, mixing the whole into an ointment. The process of ap-

plying it, is as follows :—Begin at the head of the sheep, and divide the wool with the fingers, from between the ears, along the back, to the end of the tail, in a furrow, until you can touch the skin. In the meanwhile, this furrow is making, a finger slightly dipped in the ointment, is to be drawn along the skin until it bears a blue stain on the skin, and the adjoining wool. From this furrow, similar ones must be drawn down the shoulder and thighs, to the legs, as far as they are woolly, and if the animal be much infected, two more should be drawn along each side, parallel to that on the back, and one down each side, between the fore and hind legs, and this will make a permanent cure. We should recommend on using this ointment, that the animal be housed a few days, from the weather, if it should prove stormy or damp.

SUPERIOR RED INK.

On four ounces of best carmine, pour two ounces of caustic amonia, adding twenty grains of the whitest and clearest gum arabic; let these remain until the gum is entirely dissolved. This ink, more expensive than the common one, will continue its bright red colour, for forty or fifty years.

MOSAIC SILVER.

This is a metallic alloy, in the form of silver

flakes, used as a pigment for giving a white metallic lustre in imitation of silver bronzing. It is prepared in the following manner. Take an ounce and a half a grain of tin, and the same quantity of bismuth, melt them together, in a clean crusible, and stir the mass repeatedly, with a clean iron rod till the two metals are accurately mixed; then remove the crucible from the fire, and when its contents are upon the point of becoming cold, or solid, pour in one ounce and a half of quicksilver, previously made warm, stirring it as before, till it is cold, and becomes a flaky powder. It may be used dry, similar to copper or gold bronze; or ground with gum water, on a clean marble paint stone, and laid on with a pencil; either way, it must be well secured with white copal varnish; or may be ground with the white of an egg, and alcohol varnish that is white, and in this state, applied to the intended work; when dried it may be burnished in the usual manner. It has very much the appearance of silver.

THE METHOD OF LAYING THE BRONZE GILDING.

The ground work for ornamental bronzing is a greenish black, made of lamp black and verdigris, ground in varnish; and when a sufficient body of this is laid on, and thoroughly dried and polished, the sizing must be laid on with a fine and soft brush, and dried in the shade, sufficiently. Having thus prepared the

work ready to receive the figures, which must be formed by cutting holes through pieces of paper, lay these patterns on the work, when the varnish is adhesive as above described, but not press them down any more than is requisite to keep the paper in its place; then take a small piece of deer skin, made fast to a wooden handle, in such a manner, that the leather will spring a little when used for bronzing; several of these tools will be necessary-of different sizes, and some small and short camel's hair pencils will be necessary with these tools. The bronze must be applied by first breathing on the deer skin or pencil, and then dipped in the dry bronze and applied to the pattern or figures, beginning at the edges; the camel's hair pencil may be used for the light shades, different kinds of bronze may be used, as different shades are required, thus any figure may be produced in a variety of shades, by applying the bronze more freely to some parts than others. If some internal parts of the figures, require to be more distinct than others, they may be edged with dark coloured paint. In some work, it may be well to extend the varnish no farther than the intended figures, in which case any projecting or branching parts of the figures may be drawn with a camel's hair pencil, and the patterns may, in some measure be dispensed with; in either case, the work must afterwards have one or more coats of copal varnish.

TO WASH BRASS OR COPPER WITH SILVER.

To half an ounce of the strongest nitric acid, in a phial, add one ounce of water, and one fourth of an ounce of good silver, rolled thin and cut into fine chips; it will soon be dissolved. This is called nitrate of silver, and is transparent and colourless. Add to this, a solution of nearly two drachms of common salt, in any quantity of water that will precipitate the silver to the bottom of the phial, in a mass. Pour off the water with the acid, and add to the silver, an equal quantity of cream tartar; thus forming a soft paste, dip a piece of soft leather in this paste, and rub it on the metal to be silvered; continue rubbing it till it is nearly dry; then wash it with water, and polish, by rubbing it hard with a piece of dry leather. Another way is, to add pearlash to the nitrate of silver, as long as ebullition ensues; then the acid is poured off, and the precipitate, which is white, at first, but becomes green, when dry, is mixed with double its quantity of common salt, and cream of tartar; with this composition, being moistened, the metal is rubbed over, &c.

TO VARNISH MAPS, CHARTS, PICTURES, &c.

Take a piece of fine linen or cotton cambric, rather larger than the map or picture to be varnished, and draw it straight upon a frame of convenient size, and confine it at the edges

by small tacks; lay a thin coat of fine rye flour paste on this, and on the back of the paper that is to be varnished; lay the paper on the cambric, and press them together till the paper adheres firmly in every part. When this is dry, give the face of the print two or three coats of a strong solution of gum arabic in water. This sizing must be spread over the work very quickly, and with as little brushing as possible; afterwards, give the work two or three coats of varnish, made from South American copal, as it is a colourless varnish.

TO MAKE BRUNSWICK VARNISH.

Take one pound gum asphaltum, and melt it over a slow fire; then take it from the fire, and add spirits of turpentine in small quantities, stirring it briskly till it is of the consistence of other varnishes; as there is some danger of its taking fire when the spirits of turpentine is added, it would be necessary to be provided with a piece of wet flannel to throw over it, if that should happen; when it is nearly cold, strain it through flannel and bottle it for use. The black varnish is used for bordering picture glasses, and is the most perfect black in nature, for that use; it is water proof, and dries quick.

TO MAKE SILVER SOLDER.

Melt fine silver two parts, brass one part;

do not keep them long in fusion, lest the brass fly off in fumes.

A SOLDER FOR GOLD.

Melt copper one part, fine silver one part, and gold two parts; add a little borax, when it is just melted; then pour it out immediately.

MOSAIC GOLD.

Melt two ounces of tin, and mix with it one ounce of quicksilver; when this is cold, pulverize it, and add one ounce of salamoniac and one of sulphur, and grind them all together; put the compound in a flask, and heat it in a clear fire, (carefully avoiding the fumes,) till the mercury subsides and rises in vapour; when the vapour ceases to rise, take the flask from the fire, a flaky gold coloured powder will remain in the flask, which may be applied to ornamental work in the manner of gold bronze, of which it is a good imitation.

TO PAINT IN VARIOUS SHADES ON WOOD OR CLOTH.

Paint the ground work white, or yellow, with oil paint; when dry, grind any of the following colours, Prussian blue, burnt terra di sienna, rose pink, burnt ochre, in strong vinegar, or whiskey, perfectly fine. Lay on a coat of any of the above colours, upon the

white, or yellow ground; then take a bladder that has been previously soaked in the same kind of liquor, that the above colours are ground in, and shade with the bladder, by taking it in one hand and patting or stamping on the paint; and wherever the folds of the bladder strike into the paint, the different shades are made. When dry, give the work one coat of boiled oil; and when dry, polish lightly with fine sand paper, and then varnish. This kind of painting is made use of, on carpets for stairs, and floors of rooms, and the inside of wagon and sleigh boxes, and various other uses.

TO MAKE CRAYONS OF VARIOUS COLOURS.

Crayons consist of various coloured pigments, or paints formed into sticks or rolls, for the purpose of drawing and shading with them, in the manner of lead pencils; but that they may be of a uniform texture, or hardness, different ingredients and materials require some variation, in the management. To make white crayons, nothing more is requisite, than to mix superfine or refined whiting with alcohol, to the consistence of soft putty; form it into rolls of a convenient length and size, and let them dry; or the whiting may be mixed with water, and a sufficient quantity of burnt or calcined sulphate of lime, to give the crayons a sufficient degree of hardness, when dry. A great variety of elegant light colours may

be formed by adding to the whiting, prepared as above, any of the coloured pigments. The most proper colours for crayons are lamp black, Prussian blue, burnt amber, burnt terra di sienna, red ochre, vermilion, lake, rose pink, chrome yellow, yellow ochre, and mineral green. Many other handsome greens are formed by mixing chrome yellow with Prussian blue, varying the proportions; and purples are produced by mixing rose pink or lake, with blue, Prussian blue, and lake, being each naturally of a binding nature, require only to be ground in water; but red ochre and vermilion should be ground in alcohol or may have some quantity of sulphate of lime mixed with them. Any of these colours may be mixed in any proportion with whiting, or each other; each compound having a sufficient proportion of sulphate of lime to give it a proper degree of hardness and strength when dry. The proper length for crayons is from two to three inches, and the size as that of a tobacco pipe stem. It is customary in making crayons, to have at hand a large piece of chalk with a plain surface, on which to lay the crayons as soon as they are rolled; the chalk absorbs a part of the moisture which makes them dry quicker, and without cracking.

TO PAINT IN FIGURES FOR CARPETS, OR BORDERS.

Take a sheet of paste board or strong paper, and paint or draw thereon, with a pencil, any

flower or figure that would be elegant for a border, or carpet figure; then with small gouges and chisels, or a sharp penknife, cut out the figure completely, that it be represented by apertures, cut through the paper. Lay this paper or pattern, on the ground, intended to receive the figure, whether a floor or painted cloth; and with a stiff smooth brush, paint with a quick vibrative motion, over the whole figure; then take up the paper and you will have an entire figure, on the ground.

NOTE. If a floor is to be thus painted, in imitation of a carpet, the pattern must be perfectly square, and the figure so designed, that when several of them come together, they may completely match each other; and when different colours are used in the same figure, they must be kept a little separate from each other, and wrought with different brushes.

CASE HARDENING IRON.

Take the salt, called prusiate of potash, which may be had of all the chemists. Powder the salt, and sprinkle upon the iron, when in a state of redness; it will be found to run like oil, and when plunged into cold water, will be found to be as hard, and harder than iron, case hardened in the usual way. The preparation is easy, and serves a great length of time.

TO CLEANSE SILVER OR GOLD, AFTER IT IS SOLDERED.

Make it just red hot, and let it cool; then boil it in alum water, in an earthern vessel, and it will be as clean as when new. If gold, boil it in chamber lye and salamoniac.

THE METHOD OF SOLDERING GOLD AND SILVER.

After the solder is cast into an ingot, it would be more ready for use, if you were to draw it into small wire, or flat it between two rollers; after that, cut it into small bits, then join your work together, with soft iron wire, and with a camel's hair pencil, dipped in borax finely powdered, and well moistened with water, touch the joint, intended to be soldered, placing a little solder upon the joint, apply it upon a large piece of charcoal, and with a blow pipe and lamp, blow upon the flame, until it melts the solder and it is done.

TO PAINT MAHOGANY.

Paint the ground work a flesh colour, by grinding white and red lead together, in oil; when this ground is dry, grind on a stone, some burnt English terra disienna, with strong beer; lay on a coat of this with a clean brush, then having ready provided a number of pieces of linen or cotton cloth, take of these cloths and shade, through this last colour, ac-

cording to fancy, having a piece of mahogany lying before you at the same time. When one piece of cloth is much absorbed with paint, throw it aside, and take a clean piece, and so on, until the shades are finished according to fancy. If the second coat dries too fast for the shading, the cloths must be moistened with beer. When the shades are thus finished, and nearly dry, take a soft brush, and brush it lightly over the work, till it is smooth; then with a flat graining tool, dipped in some beer, coloured with terra di sienna, grain the work over the light shades. When the work is dry, which will be the case in a few minutes, lay over the work, a coat of copal varnish, and when dry, repeat the operation till an even varnish is given over the whole work. The operation of shading must be done quick, on account of the great dryness of the terra di sienna and beer.

TO WHITEN BRASS OR COPPER, BY BOILING.

Put the brass or copper into an earthern boiler, with some white tartar, alum and grain tin, and boil them together. The articles will soon become covered with a coating of tin, which when well polished, will look like silver. It is in this manner that buttons are whitened.

TO MAKE A COPY OF A PRINT OR PICTURE.

Take a sheet of the finest white paper, wet

it over with bleached linseed oil, or unprepared linseed oil, and spirits of turpentine in equal quantities. When the oil is soaked through the paper, wipe it off clean ; then let it stand and dry ; otherwise, it would spoil the printed picture, by the soaking through of the oil.—Having thus prepared the paper, lay it on any printed or painted picture, and it may be seen perfectly through ; then, with a black lead pencil, copy with ease any picture on the oiled paper, then put it upon a sheet of clean white paper, and with a little pointed tracer or burnisher, go over the strokes, drawn upon the oiled paper, and the same will be very neatly and exactly drawn upon the white paper.

TO TAKE OFF A COPY FROM A PRINT OR PICTURE.

Make a water of soap and alum, with which wet a cloth or paper ; lay it either on a print or picture, and pass it once under a rolling press ; you will have a very fine copy of whatever you have laid it upon. When a rolling press is not easily obtained, a pressure in a large wooden vice will answer.

BEST METHOD OF COPYING A PICTURE.

The usual manner of copying in landscape, and which will answer for pictures of any size is to rub over the back of the picture with plumbago, or red ochre ; then lay the picture on the ground that is to receive the copy, and

trace the lines with a smooth pointed steel, or piece of hard wood. The ground will thus be very accurately and distinctly marked, by the plumbago or ochre, adhering to the lines that are traced. When several copies are to be taken from the same pattern, which frequently occurs in ornamental painting, the outlines of the first may be perforated with a needle, set in a handle, so that being laid on the other grounds, that are to receive the copies, and brushed over with a little fine dry whiting or red ochre, as the case may require, the whiting or ochre will penetrate the perforated lines of the pattern, and thus mark the ground on which it is laid.

TO MAKE LIQUID JAPPAN BLACKING.

Take three ounces of ivory black, two ounces of coarse sugar, one ounce of sulphuric acid, one ounce of muriatic acid, one table spoonful of sweet oil, and lemon acid, and one pint common vinegar. First mix the ivory black and sweet oil together; then the lemon and sugar, with a little vinegar to qualify the blacking; then add the sulphuric and muriatic acid, and mix them all together. The sugar, oil, and vinegar prevent the acids from injuring the leather, and add to the texture of the blacking.

TO DYE SKINS BLUE.

Boil elder berries or dwarf elder, then smear the skins and wash them therewith, and wring them out; then boil the berries as before, in a solution of alum water, and wet the skins in the same manner, once or twice, dry them, and they will be very blue.

TO DYE HATS GREEN OR ANY OTHER COLOUR.

A patent was granted in 1830, to Robert Goulding of London, hat dyer, for his method of dyeing, staining, and colouring beaver hats, green or any other colour. The inventor directs the nap of the hat to be raised by means of a card, on the side intended to be dyed, and then boiled in alum argol. A thin paste should be made of flour or clay, which is spread over every part that is not to be dyed, and then closed; or the hat may be previously pasted, and instead of being boiled, it should only be simmered in the same liquor. As soon as the paste is spread, plates of copper or other metal, shaped like a common funnel are fixed over the paste to prevent the dye from penetrating through. In this state, the hat is immersed in the dye, till the colour is sufficiently fixed, when it is taken out, opened and cleansed from the paste; but if any colouring particles have penetrated through the felt, they may be removed by rubbing them with a small quantity of spirit of salt, aquafortis, &c. The com-

pounds employed in dyeing, are fustic, turmeric, ebony, saffron, alum, argol, indigo, and vitrol, with urine or pearlash, at the option of the dyer; all which are used separately, or together, according to the colour required.

GOLD SHELL.

It is made of the parings of leaf gold, and even of the leaves themselves, reduced into an impalpable powder, by grinding on a marble, with honey. After leaving it to infuse some time in aquafortis, they put it in shells, when it sticks. To use, they dilute it with gum water or soap water. It is used by the illuminators and with which, they write letters of gold.

TINNING OF IRON.

When iron plates are to be tinned, they are first scoured, and then put into what is called a pickle, which is sulphuric acid, diluted with water. This dissolves the rust or oxide, that was left after scouring, and renders the surface perfectly clean. They are then again washed and scoured. They are now dipped into a vessel full of melted tin, the surface of which is covered with fat or oil to defend it from the action of the air. By this means, the iron coming in contact with the melted tin in a perfectly metalic state, it comes out completely coated. When a small quantity of iron only, is to be tinned, it is heated and the tin

rubbed on with a piece of cloth—having first sprinkled the iron with some powdered resin, the use of which is to reduce the tin that may be oxidated. Any inflammable substance, as oil, for instance, will have in some degree, the same effect, which is owing to their attraction for oxygen.

METHOD OF TAKING A CAST IN PLASTER FROM A PERSON'S FACE.

The person whose likeness is required in plaster, must lie on his back, and the hair must be tied back, so that none of it covers the face. Into each nostril, convey a conical piece of stiff paper, open at both ends, to allow of breathing. The face is then lightly oiled over in every part with sallad oil, to prevent the plaster from sticking to the skin. Procure some fresh burnt plaster, and mix it with water to a proper consistence for pouring; then pour it by spoonfuls, quickly all over the face, taking care that the eyes are shut, till it is entirely covered, to the thickness of a quarter of an inch. This substance will grow sensibly hot, and in a few minutes it will be hard, and form a mould, in which a head of clay may be moulded; and therein the eyes may be opened, and such other additions and corrections may be made as are necessary. Then this second face being anointed with oil, another mould of plaster must be made upon it, consisting of two parts, joined lengthwise, along the ridge

of the nose, and in this a cast in plaster may be taken, which will be exactly like the original.

TO TAKE CASTS FROM MEDALS.

In order to take copies of medals, a mould must first be made. This is generally, either of plaster of Paris, or of melted sulphur. After having oiled the surface of the medal, with a little cotton, or camel hair pencil, dipped in oil of olives put a hoop of paper around it, standing up above the surface of the thickness you wish the mould to be. Then take some plaster of Paris, mix it with water, to the consistence of cream, and with a brush, rub it over the surface of the medal, to prevent air holes from appearing; then immediately afterward, make it of a sufficient thickness, by pouring on more plaster. Let it stand about half an hour, and it will in that time, grow so hard, that you may safely take it off; then pare it smooth on the back and round the edge neatly. It should be dried, if in cold or damp weather, before a brisk fire. If you cover the face of the mould, with fine plaster, a coarser sort will do for the back, but no more plaster should be mixed at one time, than can be used, as it will soon get hard, and cannot be softened without burning over again. Sulphur must not be poured upon silver, as this will tarnish it.

To prepare this mould for casting sulphur or plaster of Paris in; take half a pint of

boiled linseed oil, and oil of turpentine one ounce, and mix them together in a bottle; when wanted, pour the mixture into a plate or saucer, and dip the surface of the mould into it; take the mould out again, and when it has sucked in the oil, dip it again. Repeat this, till the oil begins to stagnate upon it, then take a little cotton wool, rolled up to prevent the oil from sticking to it, and wipe it carefully off. Lay it in a dry place, for a day or two, if longer, the better, and the mould will acquire a very hard surface from the effect of the oil.

To cast plaster of Paris in this mould; proceed with it in the same manner as above directed, for obtaining the mould itself; first, oiling the mould with olive oil. If sulphur casts are required, it must be melted in an iron ladle.

ANOTHER METHOD WITH ISINGLASS.

Dissolve isinglass in water, over the fire; then with a hair pencil, lay the melted isinglass over the medal; and when you have covered it properly, let it dry. When it is hard, raise the isinglass up with the point of a penknife and it will fly off, like horn, having a sharp impression of the medal. The isinglass may be made of any colour by mixing the colour with it, or you may breathe on the concave side, and lay gold leaf on it, which, by shining through, will make it appear like a gold med-

al. But if you wish to imitate a copper medal, mix a little carmine with the isinglass, and lay gold leaf on as before.

TO MAKE CARMINE.

For the preparation of carmine, four ounces of finely pulverized cochineal are poured into four, or six quarts of rain water, that has been previously boiled in a pewter kettle, and boil it for the space of six minutes longer, (some advise to add during the boiling two drachms of pulverized crystals of tartar,) eight scruples of Roman alum, in powder, are then to be added, and the whole kept upon the fire one minute longer; as soon as the gross powder has subsided to the bottom, and the decoction becomes clear, the latter is to be carefully decanted into large cylindrical glasses, covered over and kept undisturbed, till a fine powder is observed to have settled at the bottom.—The superincumbent liquor is then to be poured off from this powder, and the powder gradually dried. From the decanted liquor, which is still much coloured, the rest of the colouring matter may be separated by means of the solution of tin, when it yields a carmine little inferior to the other.

TO MAKE WHITE VITROL.

Mix five parts of sulphuric acid with twenty parts pure water; then add gradually, three

parts of zinc ; the zinc should be cut or broken into small pieces, not exceeding the size of a hazle nut. When the ebullition or foamy appearance ceases, the liquor must be strained, and after being evaporated over a gentle fire, and then placed in the cool air, white chrystals will be formed, which are the white vitrol.—The vitrol obtained in this way is far superior to the native vitrol.

GOLD COLOUR COPAL VARNISH.

Take copal in powder one ounce, essential oil of lavender two ounces, essence of turpentine six ounces. Put the essential oil of lavender into a matrass of a proper size, placed on a sand bath, heated by an Argunds lamp, or over a moderate coal fire. Add to the oil, while warm, and at several times, the copal powder, and stir the mixture with a stick of white wood, rounded at the end.—When the copal has entirely disappeared, add at three different times, the essence almost in a state of ebullition, and keep constantly stirring the mixture. When the solution is completed, the result will be a varnish of a gold colour.

TO RENDER PAPER FIRE PROOF.

Whether the paper be plain, written, printed on, or even marbled, stained or painted for hangings. Dip it in a strong solution of alum

water, and then thoroughly dry it. In this state, it will be fire proof. Some paper requires to imbibe more of the solution, than by a single immersion, in which case, the dipping and drying must be repeated till it becomes fully saturated. Neither the colour nor quality of the paper, will be in the least affected by this process.

FULLER'S PURIFIER FOR WOOLLEN CLOTH.

Dry, pulverize, and sift the following ingredients. Six pounds of fuller's earth, one pound of pipe clay, four ounces of French chalk. Make a paste of the above, with the following:—one ounce of rectified oil of turpentine, two ounces of spirits of wine, one and a half pounds of melted soap. Make up the compound, into six penny or shilling cakes, for sale. These cakes are to be kept in water, or in small wood boxes

TO OBTAIN A DYEING MATTER FROM POTATOE TOPS.

Cut off the tops when they are in flower, and extract the juice, by bruising and pressing it. Linen or woollen, imbibed in this liquor, forty eight hours, will take a brilliant colour. If the cloth be afterwards plunged in a blue dye, it will acquire a permanent green colour.

MORDANT VARNISH FOR GILDING.

Take of gum mastick one ounce, of gum sandarack one ounce, of gum guttae half an ounce, of turpentine a quarter of an ounce, of essence of turpentine six ounces. Some artists, who make use of mordants, substitute for the use of turpentine, an ounce of the essence of lavender. The application of them, however, is confined chiefly to gold. When it is required to fill up a design with gold leaf, on any ground whatever, the composition, which is to serve as the means of union between the metal and ground, ought neither to be too thick, nor too fluid; it will be requisite that the composition should not dry till the artist has completed his design.

JAPPAN BLUE.

Take gum water what quantity you please, and white lead, a sufficient quantity, grind these well on a porphory; then take isinglass size, what quantity you please, of the finest and best smalt, a sufficient quantity; mix them well; to which add of your white lead before grouud, so much as may give it a sufficient body; mix all these together to the consistence of a paint.

TO REMOVE FRECKLES FROM THE FACE.

Put into a phial any desired quantity of lemon juice, and mix with the juice a small quantity of powdered borax, and a little refined sugar. Let it stand for eight days, and then apply it frequently, to the freckled part, by means of a sponge or soft rag; by this application, the freckles will all be removed in a short time.

ERRATA.

PAGE

36, in the 8th and 9th lines from the bottom, for "it is fit for use", read, *filter for use.*

49, in the 10th line from the top, for "soon," read, *even.*

52, in the 11th line from top, for "pricked", read, *picked.*

53, in the 12th line from the bottom, for "appertain," read, *appear.*

63, in the 15th line from the top, for "requires, read, *acquires.*

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